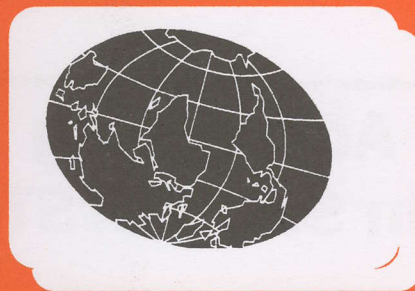


Bob Cooper's

January 22 2007

SatFACTS

MONTHLY



Reporting on "The World" of satellite television in the Pacific and Asia

IN THIS ISSUE

**Behind Closed
Doors:
FreeView's Birth**

**NZ Telecom to
market
FreeView-Plus**

**One Antenna:
Seven
Satellites?**

- ✓ Latest Programmer News
- ✓ Latest Hardware News
- ✓ Satellite Regional
- ✓ Observer Reports

Regional Service Functionality

TVNZ transmits multiple versions of its channels in order to provide regional advertising. The FreeView/DTH satellite service intends to replicate the capability to deliver separately to the six geographic regions to which TVNZ currently deploys its terrestrial advertising.

The service information associated with all channels is designed to allow identification of the region for which they are intended. Receivers will be set up on installation with a code that enables the delivery of the appropriate set of regional services for its location.

When a new FreeView receiver is turned on, the viewer will be presented with an attractive screen on their TV display which asks, "Where are you?" The viewer will choose from a list of names. By selecting one of these locations, this will configure their receiver to receive the associated bouquet of channels.

The list is:

Northland, Auckland, Waikato, Rotorua, Bay of Plenty, Taupo, Gisborne, Napier, Hastings, Taranaki, Wanganui, Manawatu, Wairarapa, Wellington, West Coast, Canterbury, Southern Lakes, Otago and Southland.

This selection will cause that particular receiver to relate to just one regional bouquet. There are 6 (master) 'bouquet regions' and each will be able to accommodate up to 45 services or channels within its bouquet. The six are: Auckland, Waikato, Central, Wellington, Christchurch and Dunedin.

If the viewer moves (into a new region) or for any other reason wishes to become part of another viewing region, the receiver will be flexible to make that change.

(Above edited from an outline prepared to explain FreeView's new RSF software.)

Vol. 13 ♦ No. 149

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See page
28!

SatFACTS MONTHLY

ISSN 1174-0779

is published 12 times each year (on or about the 15th of each month) by Far North Cablevision, Ltd.

This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

Editor/Publisher
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Office Manager
Gay V. Cooper (ZL1GG)

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Now year thirteen!

What is the business plan here?

The New Zealand future for home satellite grows more complex, intriguing, by the week. A summary.

The government has approved a plan where 25% of the population will depend upon Ku-band satellite for digital free to air service (FreeView), the 75% balance will be blanketed by a terrestrial UHF network that will by some undecided date replace all analogue transmitters. Along the way, all existing analogue TV receivers, VCRs, PVRs will require either a digital to analogue STB to continue to function, or, simply go to the tip and be replaced with new digital- demodulating devices.

Four million people, 1.5 million residences, more than 3 million analogue items to be converted or tipped. The cheapest route will be a terrestrial STB added to the existing analogue device; TV, VCR, PVR. If the current marketing state in Australia is any indication (this issue, page 2), for NZ\$45.27 chain stores nation-wide will be offering that conversion - say mid year 2008.

But there is more to digital than simply a STB added to an existing FTA analogue receiver. There is EPG, HDTV, RSF - all terms few yet appreciate, understand, or have worked out the value for.

Digital terrestrial will be self-limiting; relatively short-range coverage UHF, with someone else deciding what programme channels viewers will access. Digital satellite is another matter.

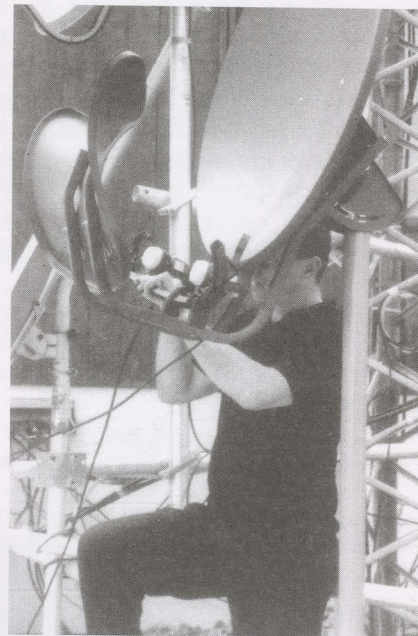
Perhaps 99.95% of all Kiwi's associate SKY TV with satellite - without SKY, there is no such thing as satellite TV in the public mind. But of course there is - as FreeView

will be challenged to convert public comprehension of the word. There is also life beyond FreeView. Alas, FreeView has the resources of TVNZ, CanWest and now Telecom NZ behind it which places this trio directly opposite the resources of SKY NZ - which of course has Rupert Murdoch backing it.

Lost in this contest will be programming options beyond both SKY and FreeView. Unfortunately, lacking the marketing muscle and resources of TVNZ, CanWest and Telecom, there is no venue for educating the public to the seven-satellite-option. And this is the challenge facing those who don't feel comfortable being on either the SKY or FreeView teams. If even ten percent of the homes were to somehow become converts to multi-satellite reception, the industry would generate as a minimum 150,000 new 'top end' installs. Seven satellites, more than 50 channels, and no monthly fees? There is a strong consumer attractive sales message here which begs a co-ordinated marketing program. The hardware is now available and we begin exploring how it works on page 12 of this issue. When someone says "SKY or FreeView?" to you, asking for your advice, your response should include, "What about seven-satellite service?"



January 22, 2007



In Volume 13 ♦ Number 149

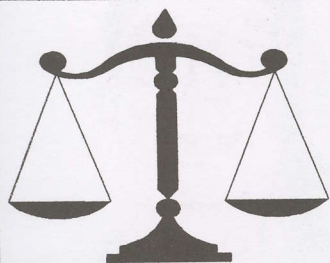
FreeView plan matures: Behind closed doors -p. 7, One Antenna Only? Is this the one??? -p. 12

Departments

Programmer/Programming -p.2; Hardware/Equipment Update -p. 4; SatFACTS Digital Watch -p. 23; Supplemental Data -p. 26; With The Observers -p. 27

-On the cover-

RSF? Add it to your techno-cabulary. It could be your future.



What about C-band?

"Reference SF#148 and the report on the new FTA Hyundai receiver. You make no mention of C-band. On page 21, you wrote, 'will locate and memorise automatically all of the (Ku band) satellites the dish can locate.' Readers might think that all the receiver is good for is moving small Ku-band antennas. If the receiver does a good job of controlling the Motec motor connected to its RF lead, it should also be suitable for controlling an actuator on a larger dish via a V-Box. I believe there are several brands available and Phoenix (p. 5, #148) lists a Moteck branded V-Box. If Kiwis are going to be limited by Council rules to a single dish, why not a C + Ku band feed?"

IF, Queensland

Indeed - why not? There could be other factors here such as the pending 2m antenna 'size' limit - a tad marginal for all but a handful of C-band signals in New Zealand.

Price is not the issue

"Attached is a copy of a local newspaper advertisement offering the 'MTV brand' of terrestrial digital STB at the Coles Supermarket chain for a stunning \$39.99. This has a built-in electronic program guide, favourite channel list, remote control (they supply the battery!) and a 12 month warranty. We all realise that individual users may require some antenna retrofitting, cabling changes, passive splitter corrections but at \$39.99, surely no one can complain about the cost of 'going digital.'

Analogue Watcher, NSW

Various government agencies claim as many as 23% of all Australian homes are now equipped for free to air digital reception, close to 2 million STB units. That would be the sum of all STBs and all digital-tuner equipped receivers sold to date. If that seems like a too large number, well, nobody seems to be defining what constitutes use of digital versus owning equipment with that capability.

Correction

SelecTV has two sport-category channels; Real Madrid and Eurosport News (p. 27, SF#148).

PROGRAMMER PROGRAMMING PROMOTION

UPDATE

JANUARY 22, 2007

February 1st? Mark-it. TVNZ scheduled to begin tests on D1, horizontal (frequency apparently 12.483H). Meanwhile, there are indications SKY NZ will begin double feeding the horizontal side of D1 as well during February. And B1 - which at presstime continues to carry a slimmed down TVNZ mux? Leaves the air 11:59PM January 31 (see page 30).

In case you missed the formal announcement, TVNZ now verifies it will produce a FreeView channel "late in 2007" which will provide 24 x 7 New Zealand news and sports coverage, and "early in 2008" a channel of children's, family, drama and niche arts. Neither of these channels will be available through the Sky package.

TVNZ's Regional Advertising challenge. As SF#148 reported (p. 1), breaking New Zealand into geographic segments and offering commercial inserts for regions such as "Wellington" or "Dunedin" has been a significant marketing plan - something only available because of operational costs - for TVOne and TV2. The mechanics of breaking the nation up into "advertising regions" was far simpler with terrestrial service than with satellite and some considered the technology required to accomplish satellite regional too expensive for the additional advertising sale returns. *No more.* A new "Regional Service Function", purposefully designed for satellite, will be introduced February 1st in some areas with a gradual expansion of the concept through November at which time TVNZ hopes to be able to offer "regional coverage advertising" to small market segments, not totally "geography defined" (see text on front cover, this issue SatFACTS). A TVNZ internal memo advises, "In regard to accessing the new national digital satellite region, our technical team is currently in the midst of adjusting our technology infrastructure to accommodate the changes we have had to make." Early details begin page 7 here, and a full run down in a future SatFACTS. There is some very creative, new, TVNZ inspired technology here as you will see.

Three Koreans, identified only by the surnames Jeong, Lee, Sim, have received jail sentences for creating and exporting "illegal set-top boxes and transmitting control words to the buyers of the receivers on a real time basis." An estimated 40,000 'special' STBs were apparently sold to users in the Middle East and Europe.

New. Measat-3, 91.5 east, scheduled to begin operations last week in January, high powered C and Ku on board - C should reach well into Australia. On AsiaSat 2, FTA Shamshad TV (Afghanistan) with some English (plus Dari and Pashto languages) 24/7 on 3790.75 vertical, Sr 2.444, FEC 3/4. France 24 is now functional 24/7. Programming is in English and French; Arabic will be added mid-year and Spanish in 2009. French leader Jacques Chirac believes the new channel will "place France at the forefront of the global battle for images."

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UBI versus Globecast

"There is an apparent channel battle affecting two imported services ongoing between UBI and Globecast. The Polish channel 'Polsat 2' has been on UBI since it began, switching to CA when UBI adopted Irdeto 2. Then, as reported in SF#146, Globecast added 'Polsat 2' to their group of Polish pay-TV channels on T13/12.563H where it apparently remains in CA. Around Christmas, UBI turned off the encryption on their version of the channel, replaced January 5 with a graphic 'Premium Channel Coming Soon'. Shortly after, the channel label changed to 'CH130' from 'PLST'. The second channel in contention, 'Aghapy', began on Globecast (T13) as a FTA. Just prior to Christmas, UBI added (T11V) the channel label 'AGHY' and EPG page 'Aghapy TV'. That lasted a few days and then UBI dropped the references to this service. It seems like Globecast will be keeping these two services exclusively. Perhaps the life of UBI is now entering its final chapters."

NS, Victoria

Globecast has the financial and world-wide transponder muscle to chip away at UBI's castle. As we suggested in SF#142 (June, 2006; p. 1) Globecast will likely win this one.

Cleaning out a warehouse?

"The attached mailer arrived in my mail box and I cannot believe this sort of total hype still exists in today's consumer electronics market."

John T, Queensland

The promotion begins with 'Enjoy Better Than Ever TV Reception' displaying a plastic enclosed butterfly shaped device with the product name 'Electronic Antenna for VHF, UHF, FM'. Decades back, enterprising folks created antenna adapters that connected the TV set's aerial socket to the house's 240Vac wiring. This one apparently does not, requiring only a 'simple connection' to the TV aerial connector. 'No more unsightly rabbit ears, no more costly roof top antenna' reads the explanation. 'Crisp, clear picture on all channels from 0 to 10; ideal for both VHS and UHF frequencies.'

UHF in channels 0 to 10? The price is \$22.90 plus \$7.90 postage and handling - with a 12 month money back guarantee.

Reminder:

Several thousand satellite system installers will attend SBE2007 in Atlanta, Georgia April 18-21 - America's largest, most complete trade show and exhibition. And a special event - 20 year reunion of C-band pioneers. See <http://www.satelliteexpo2007.com/links.html>

HARDWARE EQUIPMENT PARTS

UPDATE

JANUARY 22, 2006

Free HD PVR STBs? As Telecom NZ ponders becoming a marketing partner with (NZ) FreeView - page 7 here - and BT in the UK has begun offering a combination (terrestrial) Freeview STB and HD PVR, USA Ku band service firm DISH has eliminated all up front costs for a STB equipped to receive satellite and record in HD. As of February 1, new DISH subscribers will be gifted with their model ViP622 in exchange for subscription to a \$20 per month HD (high definition) 30 channel package. This HD PVR has all of the now standard PVR (skip, file, move) features and an extra - it will simultaneously process two separate HD (or SD) satellite channels and feed them individually to different TV sets (in cable connected rooms). Seems like there should be a 'technical solution' buried someplace here for expanding the number of NZ homes having SKY service in two separate locations in the same home without resorting to multiple STBs.

Chip progress. The science of building more and more processing systems into fewer and fewer chips is never ending. HDTV demands many layers of signal processing and the current products offering these displays typically require 24 Texas Instrument chip devices just to convert a HD video camera image into a data stream. Fujitsu has now reduced the number of chips required to 8 (using their new TIP2000 device which measures only 10mm x 15mm). At the other end of the marketplace, French firm Neotion has developed a MPEG4 to MPEG2 transcoder which slides into the standard CAM slot on an older STB. This will, at a cost in the region of US\$20, allow existing MPEG2 receivers to function with MPEG4 transmissions. It gets better: The 2mm thick PCMCIA card slot now used for authorisation purposes will with the Neotion device now do both - MPEG4 transcoding and STB authorisation.

SKY Legacy decoders/STBs. Back in October Sky began downloading new STB software upgrades specifically for the Pace DSR620 and other more modern platforms. The Pace version is known as A340 while other STBs have 0340 software. The improvements cover a wide range of decoder improvements including teletext, dual LNB support, signal screen technical data display, four button reset defaults, LNB settings, RF output channel adjustment, widescreen signalling and AMS (audience measurement system).

Antenna restriction follow-up. Auckland area's North Shore Council has attempted to clarify their proposed restriction on TV, FM, satellite, amateur and other antennas (SatFACTS #148, p. 9). "Antennas installed following existing regulations prior to June 2006 would not be affected" but the new 'law' limits to two the number of radio/TV/satellite aerials for each residential unit. Also restricted - 'joined' units are to have a single dish/aerial, aerial height is to be restricted to 3m, antenna 'size' (however that is measured) to 2m and a resource consent required for installations proposing more or higher aerials.

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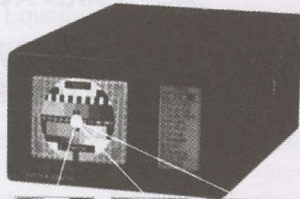
Caravan Digital Ant	\$80	PBI C+Ku band LNBF	\$65
Irdeto 2 CAM	\$70	Zinwell C band LNBF	\$28
65cm KU offset dish	\$24	Phoenix Ku band LNBF	\$18
75cm Azure shine offset dish	\$30	MT1 C band LNBF	\$18
85cm Azure shine offset dish	\$35	MT1 one cable solution LNBF	\$45
One leg gutter mount	\$18	Satellite finder	\$20
Two leg gutter mount	\$22	RG6 stripper	\$15
Tin roof mount	\$22	RG6/RG11 crimper	\$20
Wall mount	\$15	Angle meter	\$35
Superjack H-H motor	\$95	Compass High Quality	\$10
2.3m SD mesh dish	\$130	RG 6 Crimp Connector 100 pack	\$25
3m SD mesh dish	\$340	22K switch	\$10
3m HD mesh dish	\$380	Two way DiSEqC switch	\$10
3" 2.5m galvanised pole	\$30	Four way DiSEqC switch	\$12
3" 3m galvanised pole	\$35	Satellite 2 way splitter	\$1.50
3" 3.5m galvanised pole	\$40	Satellite 3 way splitter	\$2
3" Triangle Pole for C band dish	\$50	DigiAir Terrestrial hand held meter	\$360
Speaker Stand for caravan use Ku dish	\$40	Star LED Easy to use Satellite Meter	\$85

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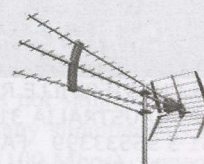


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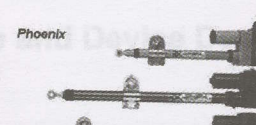
Moteck 2100 \$95ea



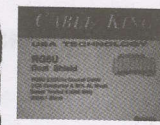
SuperJack EZ2000
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Moteck V Box II
DiSEqC1.2 Positioner
\$65/each

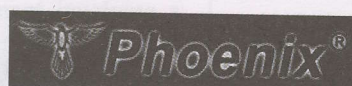


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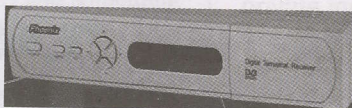


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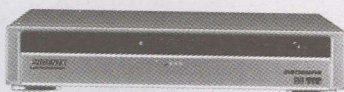
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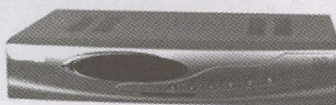
Phoenix JT-3300D
Digital Terrestrial Receiver
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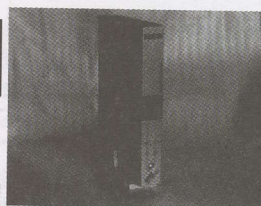
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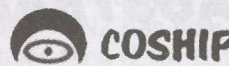
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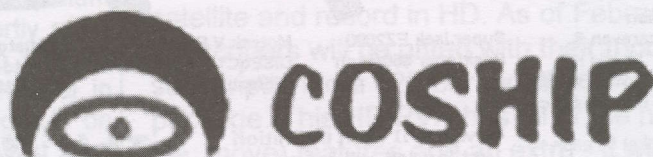
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FreeView Plan matures behind closed doors

Corporate bodies with public announcements they wish ignored or even overlooked traditionally release such statements between December 20 and January 2, hoping or believing the majority of the world will miss them. We have two examples that come close to fitting this general corporate philosophy.

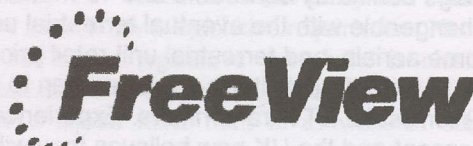
TVNZ will offer 'TVNZ On Demand' which of course means anyone with a broadband connection, if located *inside* of New Zealand, will be able to access 30 minute shows for \$2 and hour long shows for \$4. TVNZ is making this decision, to become available 'on-line' (not all programs will require a fee), after a one week experiment online experiment involving a new-to-air program called 'Karaoke High' which attracted 13,000 "unique visitors" in a seven day trial period. 'TVNZ ondemand' is scheduled to commence sometime during March. TVNZ news programming (not defined as to which news programmes), 'weekly recaps' (of news reports) and something they will call 'sneak previews' will be FTV (free to view - no charge). The announcement notes, *"With New Zealand's broadband penetration and capability now growing, this is the time for TVNZ to demonstrate leadership in the video content online space. We intend to make our programmes available to New Zealanders on every screen, and we have the quality of content to make that highly attractive to online viewers."*

Similar announcements quickly followed from Sky NZ. The Internet delivery mode has suddenly become a major focus for delivering video content and some of the new interest can be traced to Australia.

A year long study recently released to the public found 53% of the 800 web users studied over a several month period now "routinely download (illegal) video (programming) content." The key to this unexpected growth in online watching is of course broadband availability. Australian networks are already responding, as TVNZ has just announced it will be doing in March. *"Net Ten has moved broadcast release of USA origin shows such as 'The OC' and 'Jericho' to within 24 hours of their American release."* In fact of the University of Sydney survey group, 19% claimed they go to Internet because they do not wish to wait for the Australian networks to release new shows on a delayed basis. Equally impressive, 18% are using time shifting capture of Internet programming to suit their own viewing habits and 17% said Internet gives them access to programming not available in Australia.

Internet delivery capacity (speed for downloading large video files) has been a 'catch 22' for many years; slow connections (starting with the very slow dial-up access level) have effectively capped video on Internet for a large percentage of telco facility limited users. But two factors are changing this temporary cap on delivery speeds. First is the ever improving ability to compress material into narrower

Marks , Device and Device Descriptors (532)



AND the lawyers battle on. The question of which group or individual "owns the use-rights" to the term FreeView remains unsettled. Attorneys for TVNZ on December 22nd refiled an extensive application for the FreeView "trade mark." The original filing, done by a private individual not a part of TVNZ nor FreeView - the service - sought only to reserve the name and a service mark. TVNZ has now greatly enlarged their own competitive filing (210) 761265; <http://www.iponz.govt.nz/pls/web/DBSSITEN.Main>, should you be interested in the current status.

bandwidths, quite independent of the actual technical bandwidth capacity of the actual network(s). As recently as late 2005, a connection only capable of speeds under 384 kbps were significantly handicapped in delivering live video. Compression algorithms a year later have reduced that boundary to at least 256 kbps and in some instances 128 works to the satisfaction of most users.

Quite separately, Telecoms have spent, continue to spend, hundreds of billions of dollars to improve the technical capacity of their plants. Well, most telcos..

Telecom (New Zealand) has an alternate plan. Facing significantly increased competition from other suppliers released from bondage following a 2005 government decision, Telecom makes no effort to hide its reluctance to continue investing heavily in increasing the broadband capacity of its network. *"The uncertainty over (future) government regulation forces us to find alternative ways to deal with the demand for video delivery."*

Until this month, the benchmark for ultra broadband connections has been in the region of 10 Mbps - 26 times faster than the 384 limitation of most Telecom users. There is a new benchmark, in Singapore, and it is 100 Mbps - 160 times faster than 384 kbps. The new Singapore system, apparently the first in the world, is not simply about delivery speed, rather it focuses on how many simultaneous functions can be supported through a single (100 Mbps) connection. As good and as enticing to 10 Mbps might sound to someone

The start-up schedule? TVNZ's Wellington-based FreeView uplink is hoping to have a D1 horizontal transponder in a test mode February 1. An actual roll-out, complete with consumer media advertising and editorial hype, has a April 6 target date. When will the TVNZ 12.483Vt B1 transponder cease providing service? 11:59PM January 31 at which point the uplink will be reconfigured for horizontal, 12.483.

Status of STB Approvals

Two 'FreeView Consortium' (satellite) STB/receivers are scheduled for formal approval prior to the start-up of service testing February 1 (the first STBs in factory volume are scheduled to arrive in New Zealand January 25).

There are two unique-to-New Zealand design features in each: (1) MHEG-5 middleware to create interactive services (using the viewer's phone line as a connection pathway; this will be the world's first use of MHEG-5 in a satellite delivered service); (2) Something called (the) 'Regional Service Function' (RSF). The RSF concept is the brain child of TVNZ's Doug Stevens but the actual software was developed by a receiver supplier (who holds the copyright for the technique). This software allows TVNZ to feed local/regional advertising messages to distinct geographic regions, not unlike their existing terrestrial regions, but with significantly greater flexibility and in theory an almost unlimited number of separate regions. There will be some interesting 'side effects' to RSF which will surprise many who thought they previously understood (and had seen) all there was to know about FTA service.

And ... the terrestrial FreeView?

Satellite FreeView marketing, progress reports, launch schedules should not be confused with terrestrial FreeView which lags behind by between 9 and 12 months at this stage (first half 2008 roll out). The STBs for satellite are not interchangeable with the eventual terrestrial units, which may or may not require new or retrofitted UHF (band IV, V) home aerials, and terrestrial unit retail pricing will be as little as 1/3rd the satellite STB equivalent. The public posture of terrestrial digital is a master plan to reach "up to 75% of New Zealand homes" with the sum of multiple (UHF) terrestrial DTV transmitters. Experience in Europe, pointedly in the UK, makes such paper models difficult to accept and the UK now believes they will require up to 4-times as many DVB-T transmitters to reach the equivalent of what present analogue transmitters serve. The terrestrial service, unlike the satellite version, will include spectrum space for local (i.e. Gisborne) or regional (Triangle TV - Auckland and Wellington) services. The interlinking connection is this - if, at any individual location, terrestrial fails to work, there remains the satellite option which if nothing else at least offers the reality of 99.99% coverage.

struggling with 384 (or less), high definition television can require nearly two times 10 Mbps. And if one home-business connection has multiple simultaneous (PC) users, each ends up with an apportioned segment of whatever the total download throughput capacity might be. In theory, with 100 Mbps available to a location, hundreds of simultaneous users could be independently selecting video (or normal Internet usage) without overloading the input connection capacity.

Telecom NZ has signed an agreement with FreeView which has two important ingredients. First, Telecom will use its marketing muscle to place FreeView hardware into commercial areas. In effect, the Telecom shops will be competing with the retail outlets where one would normally expect to find FreeView hardware on sale. And point two. The STB which Telecom plans to bring to market will include some extras features not initially available in retail outlet versions. There will be a PVR (hard drive personal video recorder) included and the software to allow those with a broadband Telecom connection to download TV programming (including movies, in competition with the Sky Box Office service). These Telecom branded STBs will be available for purchase or equipment lease with the costs appearing on your monthly Telecom statement. All of this raises questions Telecom has not addressed formally to date:

1/ If the majority of the existing Telecom network struggles at 384 kbps or slower, how is there a business in delivering 'pay movies' which require much faster speeds? How do you burn jet fuel in a standard combustion engine?

2/ Telecom reportedly is considering a 'subsidised' marketing policy for the new (not yet formally named) STB. PVR models remain in the US\$400 region (pricing varies widely as a function of software). The resources of Telecom would allow small down payments and monthly payments appearing on the Telecom bill.

Alas, setting aside the ability to use the PVR for delayed viewing of normal (FreeView delivered) TV programming, there remains a significant challenge in convincing consumers *this* is something they need in their home. Suggestions that the Telecom-branded STB will have both FreeView STB

functions, PVR capability and DVD player included cannot be confirmed.

Consumer confusion?

In a document released by (the) Ministry for Culture and Heritage and (the) Ministry of Economic Development, dated 22 December (guaranteed to go unnoticed by most), titled, 'Discussion Paper / Analogue Switch Off: Issues for Consideration', a number of analogue switch off (abbreviated ASO) issues are considered. One section states:

"Dealing with non-Adopters: (Other markets have been concerned about ...) those who are reluctant to consider, or uninterested in, DTV conversion. Some people may not wish to adopt DTV, while others may face difficulties in making the switch by reason of affordability or a lack of sufficient technical knowledge to install their own set-top box."

Consumers are about to be inundated with a multitude of television delivery options, each offering some form of 'protection against all reception loss' when Analogue Switch-Off occurs. No date has been established for this event, by the way, and this discussion paper ponders whether there should be a 'big bang' (all analogue turned off simultaneously) or done 'progressively' (one geographic region at a time). Holland has already implemented conversion with a big bang; Germany is following the 'progressive' approach. In both countries, there are levels of (government provided) financial assistance available for those unable to afford purchase of digital reception equipment.

Holland and Germany enjoy the luxury of very high cable TV and digital satellite penetration. Cable subscribers are insulated from the conversion as the cable firm does the digital to analogue processing allowing viewer's present analogue-only TV receivers to continue functioning to a more natural replacement date. Similarly, digital satellite subscribers already have digital in the home if not past the STB.

The United States has set a date in March 2009 when 'big bang' all analogue receivers will go dead - unless they, too, are equipped with cable TV or satellite digital. There are several important issues there - federal legislation establishes that 85% of all homes must have 'digital services available' before ASO can occur. In their anxiety to push forward the turn off date for

Business Opportunities

Extra set installations: There are 660,000 SKY subscribers, of which approximately 592,000 are satellite fed. Each such SKY home with extra TV sets is a prime install candidate (however this market will be limited to non terrestrial served regions when DVB-T is launched as terrestrial STBs will be significantly less costly than satellite). Will these 'extra' sets wish a telephone connection? Unlikely.

analogue, a number of liberties have worked their way into the 85% computation process.

Depending upon which study you believe, cable TV 'penetration' falls either side of 65% of all housing units (that's stand alone homes, apartment units, even their 'trailer homes'). And an additional 20% have satellite TV (DISH or DirecTV). The sum of these two numbers just nudges the 85% required by legislation. "*Digital available in the home*" is the key phrase in almost all countries. In New Zealand, as an illustration, 42% have SKY TV - a number government number crunchers project to rise to 50% by 2010. Using the same liberal interpretation technique as the USA, the UK now claims 75% "digital penetration" - a combination of BSkyB, cable TV, SMATV, FreeView and now a brand new serious entrant - digital TV via the telephone line(s) into the home.

British Telephone (BT) is taking a different approach to NZ Telecom - they actually are going to compete with BSkyB and cable giant NTL. The NZ effort pointedly will have nothing to do with content - ownership rights for high attraction sporting events, first-run movies for example. BT is teaming with FTA terrestrial Freeview offering consumers 43 channels of 'normal television' plus a selection of sporting events and movies not elsewhere available. 'BT Vision' will supply consumers with a HD (high definition ready) set-top box that includes a personal video recorder (PVR) with initially 80 hours of recording archive time. Their only-on-BT Vision sporting coverage will include 75% of all Premiership matches while for movies they have contracted with Warner Brothers and EMI for musical concerts.

Where BT's plan differs from Telecom NZ's is in the detail. The Kiwi version STBs will be sold or leased for a fee; BT's will be 'free' to own although there is a NZ\$90 broadband connection fee plus a NZ\$180 visit from an installation engineer. The STB will receive and decode to analogue format all of the 43 FTA Freeview channels (typical stand-alone Freeview STBs now sell for around NZ\$125), and through the BT broadband telephone connection deliver IPTV (Internet protocol television) for fees ranging from British 79p to a subscription package for around NZ\$20 per month. The broadband delivery speed promised is 8 Mbps, approximately 23 times faster than Telecom 'high speed'.

BT customers are not required to subscribe to any of the service packages - after paying for the broadband connection and engineer's installation charges, (around NZ\$270), there is no additional requirement to support BT.

New Zealand consumers will have fewer choices but no less confusion in making a marketplace decision. And New Zealand (as well as Australia) could find the British and American liberal interpretation of "*a digital equipped home*" useful in the future. The December 22nd issued 'Discussion Paper' addresses the subject of ASO - "*What would an appropriate threshold level be - for example 50 or 60%?*" The answer remains unannounced but keep in mind SKY's present 42% and the forecast of 50% by 2010.

The Americans have been especially devious in calculating "digital equipped homes" using the sale of "digital ready" TV receivers as another benchmark. All receivers sold in the USA have, for several years, been forced by legislation to include

"digital capability." Virtually all TV set manufacturers have interpreted this to mean "the capacity, using an external STB, to receive digital services." Industry statistics show that 85% of all legally-digital-ready receivers sold for the past three years only work with an *external* digital to analogue reception device to receive over the air digital signals. Nobody knows what percentage of these receivers have been enhanced with a digital STB but sale of these STBs averages under 8% of new "digital ready TV" set sales so obviously this "feature" does little more than satisfy a legislative requirement. Not to worry - by mid 2007, this legislative 'loop-hole' is closing by an amendment that will require all TV sets sold after June 2007 to also have a digital tuner built in as well. In other words, connect it to an aerial and the user has OTA (over the air) digital reception. But in the three interim years, something in excess of 45 million "*digital ready*" TVs have been sold to the same folks who now, if they really want digital reception, must replace their TV sets one more time. Or recognise that without a digital STB, their "digital ready" is in name only.

The second set and VCR?

Neither the British nor American "counting" of "digital ready" goes beyond "one TV per home," yet some number in excess of 75% have two (or more) TV reception devices (in this example, an analogue VCR - useless for digital - is such a "device"). Holland, Germany, Spain - the list is very long - all have taken the same approach; if there is one digital reception device/port in a home, the home 'counts' as digital. And none of the example countries have broken out separately multiple receivers in motels, hotels, hospitals, public locations (such as airport terminals) or schools. One UK study found that between 7 and 8% of all analogue TV receivers in that country are in such facilities. Translate that same percentage to New Zealand and you find upwards of 180,000 non-home "orphan analogue receivers" in 2010 when ASO occurs.

Existing second sets, VCRs, even today's version of the PVR, will require a STB to continue functioning after ASO. SKY TV offers extra STBs to a home for \$25 each per month but the percentage of such take-up has never been quantified. It is low - unlikely to reach more than 10% of the Sky total. And this is not unusual - even in America and the UK, an "all cable" home (two or more devices connected to cable) is under 15% of all subscribing homes. Of some surprise, in the USA 'multiple satellite homes' (as customers of DISH or DirecTV) is actually higher than cable, nearly 25% or 1 in 4.

As a practical matter, the multiple set locations (whether home or hotel) are all headed for significant costs to redo their present analogue distribution systems in favour of "digital functional." SatFACTS will look at the engineering and cost challenges in this particular subset group in a future issue. The December 22nd Discussion Paper gives this group only scant mention, ending with, "*Multiple analogue TV sets in one household may require multiple set-top boxes (STBs) for a conversion to digital.*" There is no "*may*" in this one - unless the existing analogue-only TV sets, VCRs, PVRs are wholly replaced with something currently not available on the shelves of Bond and Bond or Harvey Norman: A "digital capable" TV receiver that includes a digital tuner built-in (thereby negating the need for a digital to analogue STB). What nobody in

government seems willing to address is the cost to viewers to replace not just the *first* TV receiver in a household, but all of the ancillary devices that also depend upon and work only with OTA analogue signals. Is government at any level ready to deal with the ASO date knowing that within weeks as many as 3,000,000 no longer useful analogue TV sets and appliances will appear at tips throughout the country?

Where will the action be?

Those searching for a new business direction covering 2007 through at least 2015 could consider the following options.

1/ FreeView is not likely to enjoy a significant penetration of homes until ASO is either imminent or has happened. SKY NZ will outmarket and out-program FreeView for the measurable future and Government's projection of 50% SKY home penetration by likely ASO date (2010) is realistic.

FreeView's strength will be a handful of channels, slow to start and subject to government funding whims, offering New Zealand news 24 hours, seven days, some minor sporting successes which will initially be attractive to clubs, pubs and public gathering spots. Concentrate on this commercial market, initially.

TVNZ and Cancom (TV3) both would like to initiate widescreen (16:9) display television using Freeview. With the appropriate STB (one capable of 16:9), there are nearly 70,000 16:9 displays already in consumer hands, largely relegated to DVD display and images with the top and bottom chopped off. Retailers selling consumer electronics will be quick to put these commercial 16:9 displays 'on display' and if there is a silver lining in this step to digital, the attraction of 16:9 could be the missing element. Alas, SKY is already capable of 16:9 and the only real advantage to FreeView is that it will be able to deliver 'top 40' TV shows in widescreen. Some will find that appealing, even trendy.

2/ Second sets, VCRs, will be a major market opportunity. As soon as the public realises their non 'digital-capable' receivers and VCRs must be either replaced (digital functional), modified (STB added) or trashed, the national market will rapidly focus on something in excess of a million 'conversions'.

SKY is at a disadvantage on this one - as long as their STBs cost so much and as long as they are forced, by copyright reasons, to charge as much as \$25 each per month for additional STBs. SKY must convince the public that having the full SKY channel line-up in their bedroom, kid's room, kitchen is a better choice than FreeView - which will be without cost after the initial equipment acquisition.

FreeView will offer the programming most people watch most of the time leading to a transitional period when large screen 16:9 displays are relegated to the primary viewing location where SKY is available. Many SKY installers have discovered their own secondary market to earn a living - by providing a cable from the primary viewing location to one or more additional viewing locations. The challenge here is to allow someone in the bedroom to change SKY channels with a remote control that accesses the SKY decoder in the lounge. The hardware exists, is in fact very popular in the UK, although in the USA the more common approach (because of the pricing structure for second STBs) is to simply place a pay-TV decoder at each location. This software challenge will eventually sort out, but for now, the work-around is expensive and usually limited to top-end installations. For the 'typical' home, not high end, FreeView will be an attractive choice for second set locations.

3/ SMATV. This is the tough one. A motel, hotel, hospital - even office facility wants each TV receiver to have independent selection of any channel. The initial FreeView satellite service answer is a cable distribution system capable of passing 950-2150 MHz, and a FreeView STB at each viewing location. The SKY answer is identical from a technical sense but unfortunately there is that \$25 per month charge for each additional SKY STB. The evolution of this over time (five to ten years) will be to place the STB inside of the 16:9 display TV receiver, eliminating STBs.

SMATV in New Zealand is a virtually untapped marketplace. MATVs (master antenna television) were designed and installed to technical standards covering the VHF Band I and III channels (45 to 216/230 MHz). When SKY terrestrial initially appeared, the bandwidth of the newer systems was modified to include up to 800 MHz-plus. But SKY's technical approach in many motels has relied on increasing the output power of modulators which interface between the A-V output of the STB and the MATV system - using "brute force" to overcome the design deficiencies of the older/original MATV system's Band I and III design limitations. This may have worked (sometimes, not always) when the remodulated SKY channels were grouped near the 500 MHz end of Band IV, but attempts to push more channels through the VHF-only systems higher up in frequency (such as above 700 MHz) have been largely unrewarding.

Any coaxial cable distribution system depends upon the quality (loss versus frequency in use) of the cable, the original design passband of the passive splitters and signal taps (directional couplers), the gain-bandwidth of any amplifiers, and the cable connectors in use - right up to and including the wallplate interface between the distribution system and the fly lead link to the actual TV receiver.

By a wide margin, SKY NZ has created more of these 'high power' loss-defeating installations than the balance of the industry combined. With the pending ASO, all of these installations taking their Sky reception feeds off-air from UHF transmitters will require retrofitting, replacing analogue terrestrial STBs with satellite equipment. (1)

Adding FreeView terrestrial reception to such systems may be a bit of a nightmare because of the in-use double sideband UHF modulators. The most obvious modification to such systems would be adding on-channel UHF amplification equipment allowing the terrestrial DVB broadcasts to join the pre-existing analogue services (which will, shortly, be turned off anyhow). In some unknown number of cases, SKY's double-wide analogue UHF modulators will be a serious deterrent to this approach.

Shifting the DVB-T channels to unused UHF spectrum within an existing system is technically possible, but expensive with existing hardware. However, if you operate a motel and are facing a decision between placing STBs in each room to access either terrestrial or satellite FreeView, or, replacing all of the analogue TVs with COFDM format digital-ready receivers for direct accessing of UHF DVB-T ... the decision will be a no brainer. Satellite fed? See SF#150, February.

1/ At this point in time, it is unlikely SKY's present analogue channels will be converting to a terrestrial digital format. This means that if ASO occurs in 2010, SKY analogue will shut-down as well, creating a time table for the conversion of the remaining terrestrial SKY subscribers to digital satellite.

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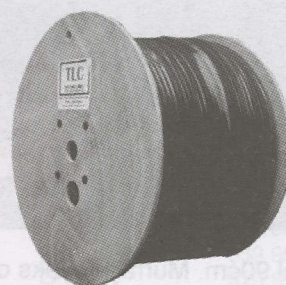
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Antennas, also known as aerials and once called "sky wires," have been a fascinating subset of virtually every aspect of receiving electromagnetic radiation from the 1884 original Hertz experiments. Twenty-five years after Hertz first demonstrated the ability to send electrons through the air to a waiting receptor, Marconi and his considerable skills remained convinced the 'aerial' was the one piece of equipment in a 'radio system' that determined the frequency of the transmissions. We now know better of course but the fascination with antenna design is no less mysterious to the average practitioner than it was to Marconi just one hundred years ago.

It was only slightly more than 30 years back (September 1976) that the first commercial use was made of satellite relay to distribute television programming to a large geographic area. The frequency was C-band, the receiving antennas were 9-10-11 metres in diameter and an installed system capable of receiving a single TV channel (HBO - Home Box Office) cost upwards of US\$125,000 (nearly \$300,000 in today's currency). Few, if any, would have forecast perfectly suitable 65cm Ku band antennas for less than US\$10 back in 1976.

At microwave frequencies, antennas create 'signal gain' in direct relation to the physical (electrical) dimensions and the skill with which the antenna system is fabricated. The instantly recognised VHF and UHF aerial, rods of aluminium artfully arranged to capture Hertzian waves dumped into the atmosphere by a suitable transmitting antenna, are of a length, width, configuration that begins with knowing the length of the transmitted wave (or frequency from which wavelength can be computed). Most VHF and UHF aerials are modelled after a formula which begins with knowing the "half wavelength" of the transmitter frequency; a 45 MHz (NZ TV channel 1) half wavelength, for example, is 3.33 metres in length and a proper antenna to receive this TV channel would begin with dimensions that reflect this length.

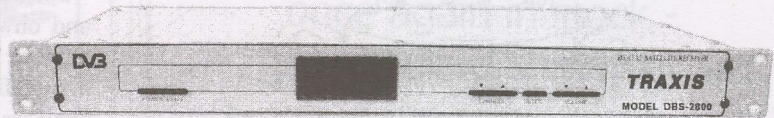
Increasing the frequency shortens the 'half wavelength' dimension - the 88-108 MHz FM broadcast band, for example, has a half wavelength dimension in the region of 1.5 metres. Our 3,700 - 4,200 MHz C-band satellite half-wavelength is much smaller - 0.038m and for our discussion here, Ku at a reference frequency of 12,500 MHz is only 0.012m. There are many reasons why this is an important factor and we'll



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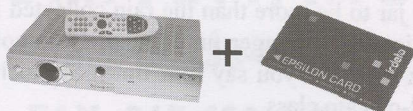
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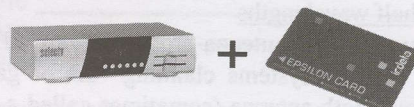
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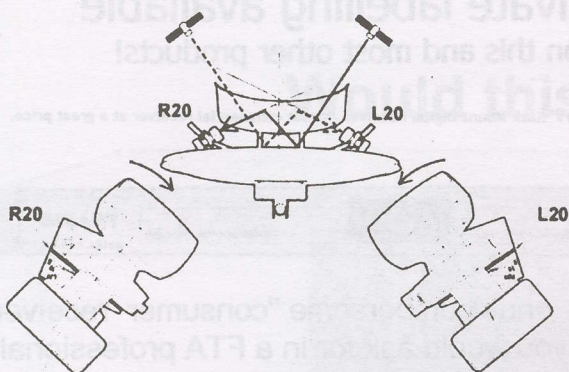


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This is the basic principal. All signals are twice reflected; first by the primary (90cm egg-shaped) reflector, then to and from the subreflector. Note that all LNBf positions are "reversed" in this process - the satellites most east end up on the LNBf most west on the support arm.

concentrate for now on just two of these. This will begin by converting 'half wavelength' to the antenna's signal gain.

Once physicists understood that the antenna did not determine the transmission frequency, it became clear that for maximum performance the antenna must 'match' the prechosen frequency (band). So the frequency determines the wavelength (or half wavelength) of the antenna. At 45 MHz, a half wavelength is 3.33 metres long while at 12,500 MHz it is 0.012m in length. A half wavelength antenna designed for 45 MHz will function with the same characteristics as one designed for 12,500 MHz although obviously one is much smaller physically than the other.

Antenna gain results when many half-wavelength antennas are somehow married into a single device. A one metre prime focus family dish would be 26 half wavelengths 'wide' at C-band, 83 half wavelengths wide at Ku band but only 0.30 half wavelength at 45 MHz. Therefore the 1m dish would create 'signal gain' at C-band and Ku band and signal 'loss' at 45 MHz, when compared to a proper half-wavelength antenna. Further, the 'signal gain' at C-band will be less than a Ku simply because there are fewer 'half wavelength' segments working together to produce gain.

An antenna to be useful for satellite reception requires gain equivalent to a minimum of 4,096 half wavelength antennas. Translate that to satellites operating at 45 MHz and you would have antennas in the region of 13,640m in width; obviously impractical; an example of how for every type of service there is a proper frequency choice.

'Stacking' the half wavelengths

A one half wavelength antenna produces "zero dB of gain." In fact, most antenna systems claiming "dB of gain" use a single half wavelength antenna (sometimes called a dipole) as a point of reference: "3 dB of gain" translates to a pair (2) half wavelength antennas somehow merged into a single aerial. From here the math becomes slightly confusing - for gain goes up in direct proportion to the number of half wavelengths included in the antenna. If it takes two half wavelength antennas to create 3 dB of gain, would 3 half wavelengths produce more gain? Yes, but not 6 dB and that is the confusing part. Here is the sticky wicket: From whatever physical size you have following the first doubling in size to achieve 3 dB

of gain, that size must be *doubled again* to realise an additional 3 dB of gain. Therefore:

- 1/ One half wave = 0 dB gain
- 2/ two half waves = 3 dB gain
- 3/ four half waves = 6 dB gain
- 4/ eight half waves = 9 dB gain
- 5/ sixteen half waves = 12 dB gain

and onward - double the 'total area' of the antenna and you achieve 3 dB more gain. An antenna claiming 42 dB of gain at a specific frequency (or band - such as Ku) requires 16,384 "half wave components"; that number is not a misprint.

How the individual half wavelength units are physically arranged is a part of the design equation. Suppose you put them all in a straight line to achieve 42 dB of gain at 45 MHz? That would be an antenna with 16,384 end to end element parts - a total of 54,559 metres. Not in your backyard, probably not in your block, possibly not in your community! Let's do the same thing at 12,500 MHz where the half wavelength is only 0.012m long. Now our 16,384 individual antenna parts would extend over a straight line of 197 metres. A 42 dB gain antenna at Ku, by the way, is approximately 1.2m across. Obviously there is more to this antenna business than "how many half wavelengths can be strung out in a line."

The Toroidal 90 (cm)

This is a two-step antenna, unusual because of its shape, design, and theory. The most recognisable segment is the main or primary reflector. No, it does not look like most reflectors - it is longer and not as high (tall) as most "standard" reflectors of a similar size. Most readers now realise that in any common satellite receiving system, there is a 'signal catcher' (the reflector) and the real 'half wavelength antenna' equivalent is actually inside of the LNBf. To be exceedingly 'pure,' the reflector is not an antenna at all - it is a passive device (with no moving nor electrically operated parts) that attaches to the system to help the actual antenna (inside of the LNBf) to function.

Back to the half wavelength antenna - or dipole. All by itself, it has no gain ("0 dB") and without the add-on reflector, that is what the LNBf antenna segment accomplishes - zero dB of gain. The reflector, by its curved (paraboloid pattern) shape captures transmitted energy and redirects it to the front of the LNBf just as a funnel left standing outside in the rain will collect water.

There is an analogy here - if you placed a funnel 100mm across in your yard and collected the water it intercepted during a rainstorm in a jar, the total amount of water in the jar at the end of the storm could be calibrated to tell you how many mm of rain fell. If you placed a second funnel, 200mm across, next to the first 100mm diameter funnel, and collected the rain here as well, logically you would expect the water in the second jar to be more than the rain collected in the 100mm funnel equipped jar (bigger funnel, more rain collecting area). How much more? If you say four times as much, welcome to the decibel-of-gain class.

Our reflector surface captures satellite energy in two directions at once, left and right along the surface and up and down on the surface as well. Think of the funnel - any rain that falls within the perimeter ends up running down the narrow bottom opening into the collection jar. The narrow tube at the bottom is your dipole antenna, the jar is your LNB (amplifier). An appropriately designed very long, thin rain collection tube of approximately 9 metre length would in fact have the same 'collection area' as our 100mm diameter round

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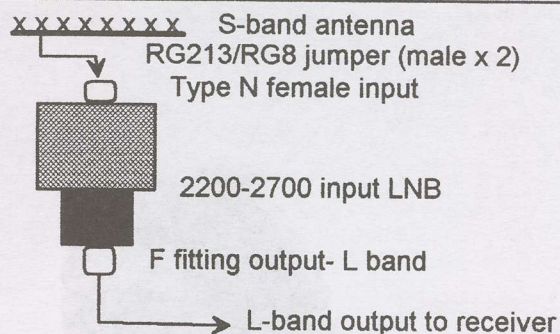
LO is 3650 MHz

Input design range is 2300 - 2700 MHz

Input fitting is type 'N' female to mate with typical
S-band type 'N' female antenna fitting

(Output fitting is type F [female] for RG6
connection to your L-band receiver)

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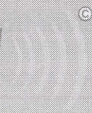
LNB'S

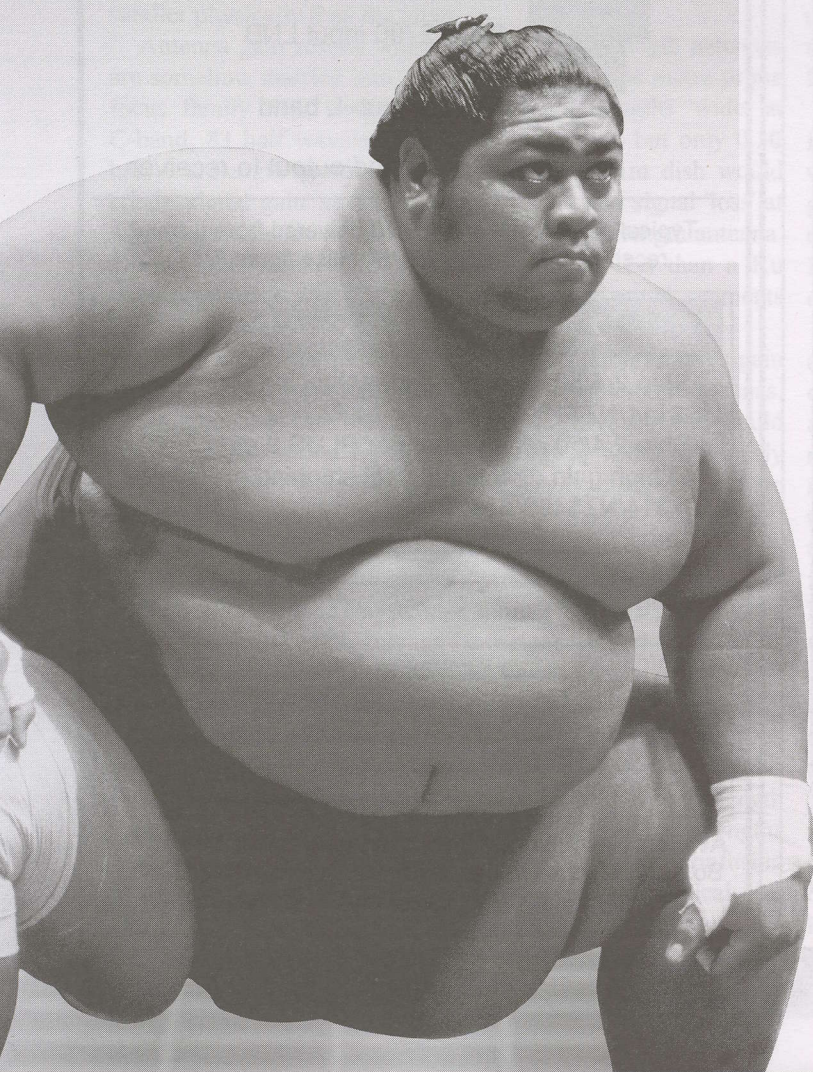
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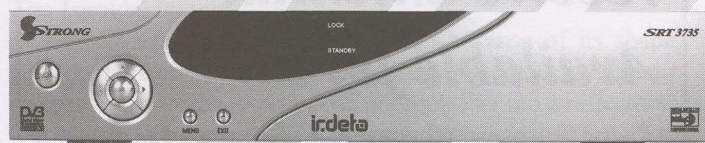
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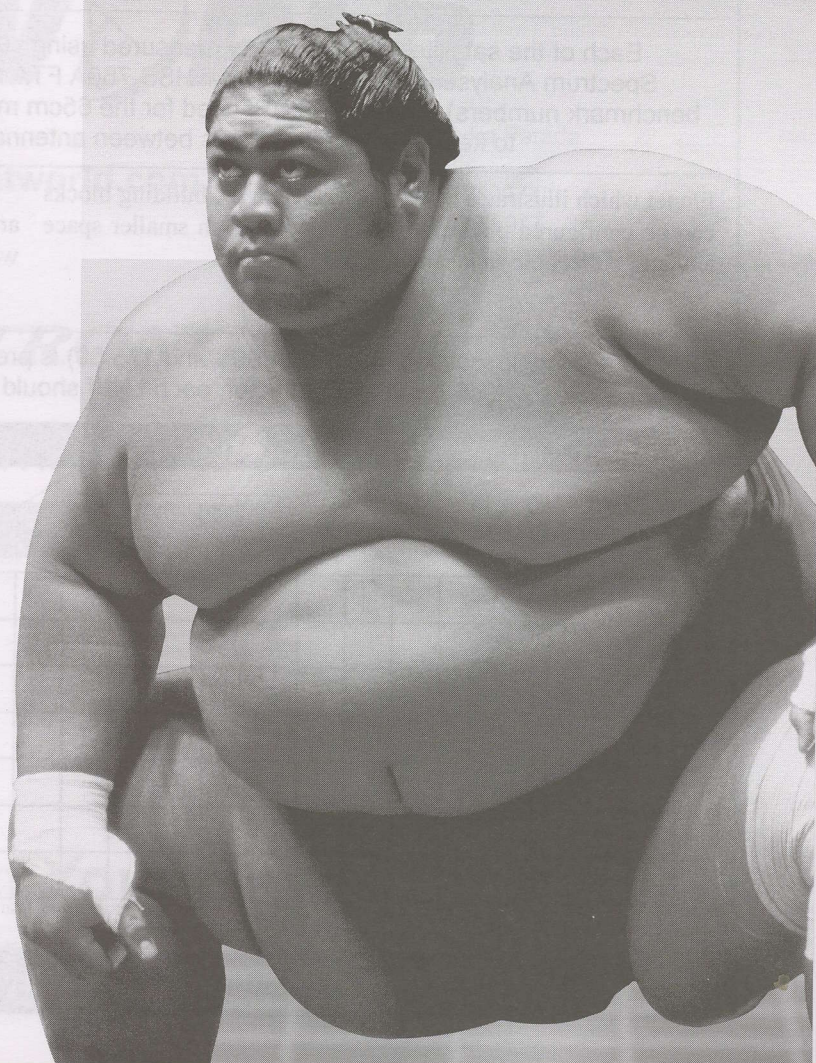
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IG Technologies



Evaluating the Toroidal 90. There is a great deal of metal here, and a demand for peak performance that each of these pieces is virtually perfectly assembled and aligned. The claim is this antenna will outperform a standard 65cm dish on each of up to 7 satellites. We began by making triple check measurements with a stock 65.



Each of the satellites were carefully measured using stock-SKY 65cm dish (left) with readout on AVCOM Spectrum Analyser (right) and Hyundai HSS-760A FTA receiver (providing signal level and signal quality as benchmark numbers). The same LNBf used for the 65cm measurements was then transferred to the Toroidal dish to keep the measurements between antennas comparable - only the dish changed.

funnel which illustrates how "half-wavelength" building blocks can be configured physically to occupy a much smaller space and still collect the same amount of rain water.

The antenna reflector functions in the same way - the 'surface area' of the total makes up thousands of individual 'half wavelength' segments, each of which collects satellite signal

Each geographic location (ours is 34.99S and 175.50) is precalculated for the dish user. This graphic presentation illustrates where, on the subreflector, each LNBf should locate the maximum signal for identified satellites.

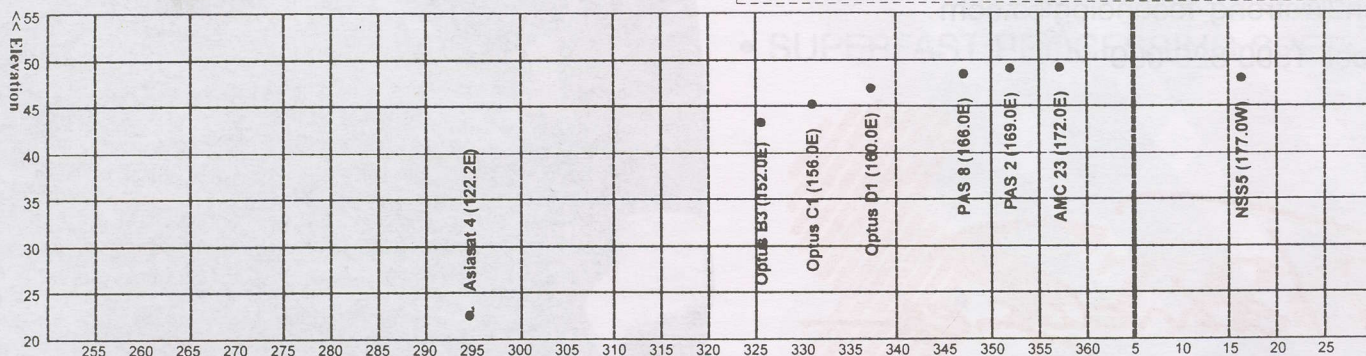
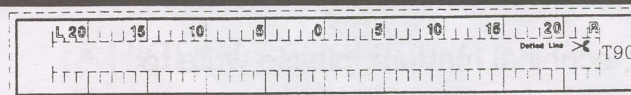
Finding Angles for Your Location

T90

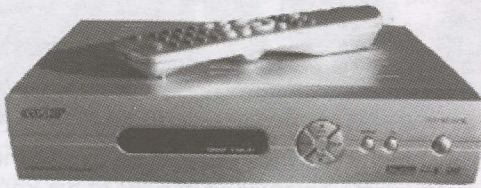
NEW ZEALAND

Coopers Beach (34.9986S, 173.5097E)

Cut off the scale on the right and use to find Elevation, Skew & Azimuth Angles.



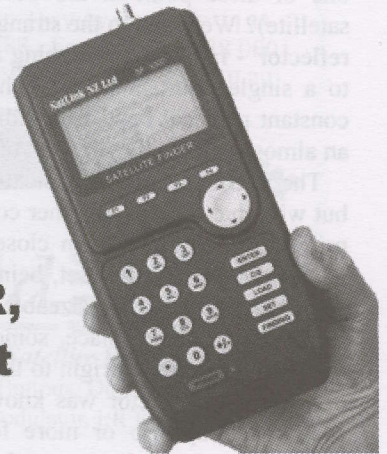
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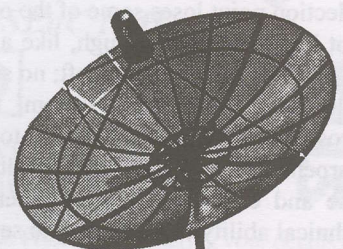
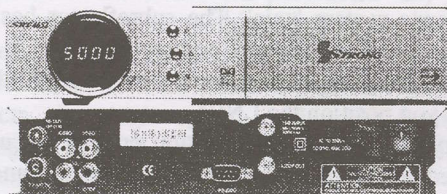
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and by reflection and focusing adds that minute amount of energy to the total available.

The reflector, then, is not really an antenna - because an antenna is *electrically connected* directly to the receiver. There are no wires connecting the reflector to the satellite receiver, hence it is an adjunct to an antenna.

Now, as illustrated here, suppose there are not one but two reflectors? Mercy! Why would there be two and why would one of these point in the wrong direction (away from the satellite)? Welcome to the strange, complex world of a 'shaped reflector' - rather than catching and focusing all of the energy to a single point in front of the reflector, this design has a constant physical bend which distributes the focus points into an almost straight line in front of the reflector. Say that again?

The Toroidal design physically resembles an offset fed dish but with that illusion all other comparisons cease. The main or primary reflector even on close inspection looks like a first cousin to a standard offset, being more like an egg laid on its side than an oval. The sizeable secondary reflector just plain looks weird, out of place, somebody's bad mistake. There is (or was) a historical origin to this antenna - in 1979 this shape of (primary) reflector was known as a 'Swan Spherical' and users lined up two or more feed antennas in front of the reflector, each feed representing a focal point for a single satellite's position in the sky.

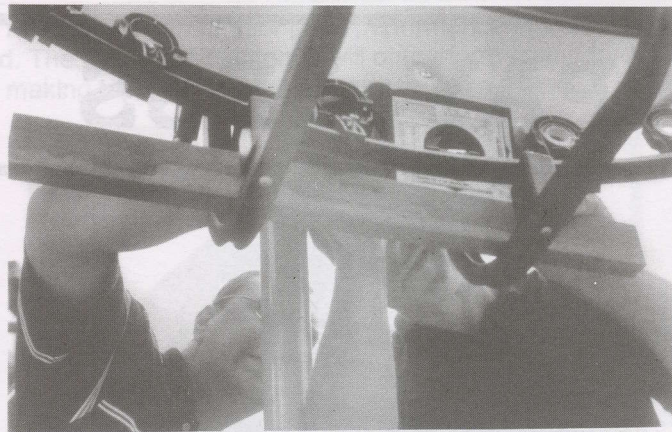
But a spherical is *not* a Toroidal - just a generation back stepping stone to today's antenna. The satellite energy intercepted by a Swan Spherical (marketed under many product brand names including the '8-Ball') went directly to the feed. But, with the Toroidal antenna, the collected satellite energy is focused not onto the feed of a LNB but to a sub or secondary reflector. It is this strange appearing and oddly shaped front piece of metal which makes this antenna so interesting. And, something of a challenge to install properly.

The LNBf goes where???

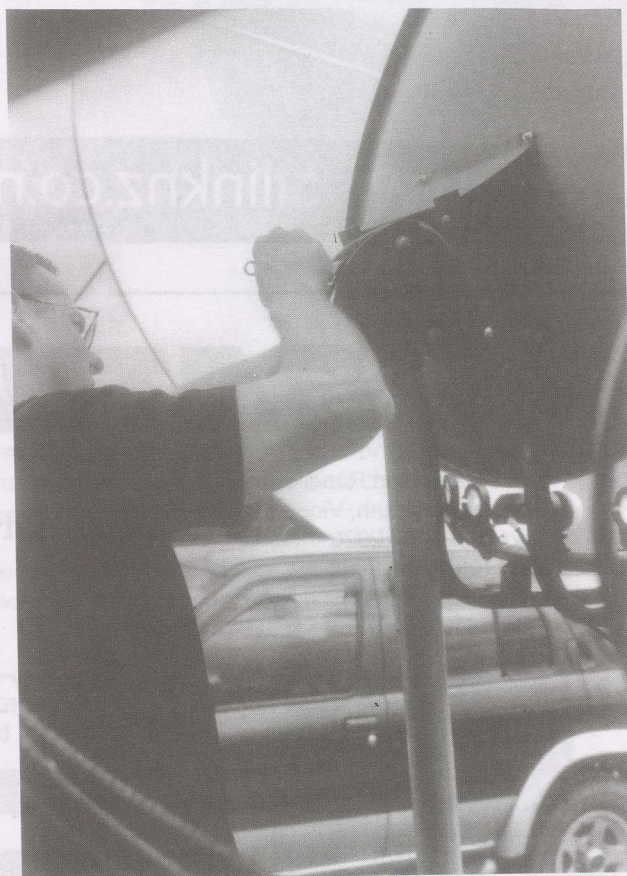
Following the bouncing signal. First it is intercepted by the larger, primary reflector which measures 1.1m in width (0.98m in height, creating the egg-shaped appearance). From this reflector the energy is focused towards the front much as you would expect to find a standard offset functioning. But down-low, front where normally the LNBf would be installed there is the secondary or sub-reflector. It rests on the same plane as the bottom of the primary reflector but at an angle. The subreflector width is 90cm (hence the product number) and it is supported by bracing so that the upper edge sits 42cm from the primary reflector, at approximately the middle, while the base of the subreflector is closer to the main reflector; 29cm. The shape of the subreflector is finely tuned for the next function.

Reflecting from the primary surface, striking the secondary or subreflector curved surface, the satellite energy has now gone through two 'bounces'. There is a trade off here. Each reflection point loses some of the original satellite energy - if it kept bouncing long enough, like a ball thrown against a wall, there would be no energy left; no signal. However, the primary reflector is a focusing system, concentrating energy from across the dish's primary surface to a point and the subreflector sharpens that point. The end result, at a cost of some expense, time and effort, is a single antenna 'system' which has the technical ability to function like seven (or even more) separate reflectors each pointing at a distinct satellite and location.

When the original signal capture occurs on the primary reflector, there is a significant but still quite broad focusing of



Elevation setting? Instructions tell you to use the flat angular plate (photo below, just to right of his knuckles) is where you place the elevation readout device. Perhaps, but the plate has a mild curve to it and you can obtain several different readings. Skew adjustment (above) is a second challenge and while not as critical as elevation, has a bearing on the tracking of the antenna through the 'full arc'.



the energy. By being redirected with the secondary or subreflector, the 'focal point' sharpens again - this contributes to the total antenna system 'gain'. The subreflector has now turned the original energy around, redirecting it to a point directly under the front lip of the primary reflector. And this, finally, is where you position the LNBf.

The geometry of this double-reflection creates a (curved) focal-line immediately under the primary reflector and the LNBf installation system allows you to select a spot along this line to permanently attach the LNBf. At that spot, it will be fed energy from a single satellite (such as D1) while at other

points along that line, other satellites (such as B3) will be separately focused. This unique design approach allows multiple LNBf devices, each positioned for a separate satellite, to be installed. One reflector with subreflector, up to 7 LNBf devices each DiSEqC selectable; changing satellites is rapid and without any mechanical rotation of the reflector surface. Think of it this way - the dish stays in one position but by some electrical magic, the illusion of 'rotation' occurs simply by selecting the appropriate RG6 cable connected to individual LNBf devices - each of which is positioning during installation to intercept maximum signal from a specific satellite.

How we did it - Part one:

There are two parts to our report - what the antenna is, and how it performs. The importer of this antenna system to New Zealand (Allister Todd, Any Solutions Ltd, [64][3] 6888 224, <http://www.toroidal.co.nz>) is one of the most product-dedicated fellows you will ever meet. He takes the installation of each of these systems very personally, offering constant critique of how you graduate from an over sized heavy duty cardboard container to high quality satellite pictures. The number of Toroidal antennas now installed in New Zealand is approaching 100 which suggests the product has found significant field acceptance.

Step one: Carefully unpack the contents and check the inventory against the well documented instructions. We found a few bolts missing and this would be a suitable point to suggest that all of the bolts, nuts and washers arriving with the antenna could be replaced with stainless steel equivalents if you live close enough to the sea that salt corrosion is a challenge.

Step two: Read the instructions. Not once but several times. The primary assembly of the antenna is surprisingly straight forward (following the ample illustrations) but the devil is in the detail and the adjustment of the parts after the bolts are in place.

Step three: Do not deviate from the instructions without clearing your modification with Allister. An extra washer, or skipping a washer, in the wrong place can have a dramatic negative effect on ultimate performance!

Step four: The antenna requires a pole for mounting, and the pole (whether using a roof mount or ground mount with the pole in concrete) must be 60mm in diameter. And New Zealand stock sizes jump from 58 to 63. A 58 is not a substitute, a 63 will not allow the mounting clamps to work. Fortunately, Allister is onto this problem and offers optional 60mm suitable mounting pipe lengths.

Step five: Some users have found it is preferable to assemble the antenna on the ground and then with two hefty folks lift it onto the mounting pipe. Obviously a roof mount could be a challenge whether you build it on the pipe or off on the ground. If you elect to build and then lift, do not attempt any of the step by step alignment adjustments (example: "antenna skew") until the antenna is permanently mounted.

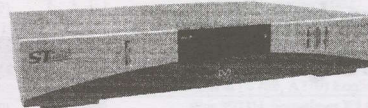
For each location Allister provides a "sky map" illustrating how each satellite within view will line-up across the subreflector (illustration, p. 18). You select the 'sky map centre' at the time of initial adjustment and as our example depicts, the single system will cover from NSS5 (177W) through B1 (152E) with 5 other Ku-sats falling between these two edge extremes.

Performance and tuning? Next month in our part-two report but these early indications: Yes, it is possible to achieve performance surpassing individual 65cm antennas.

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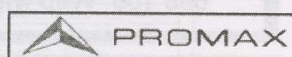
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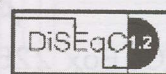
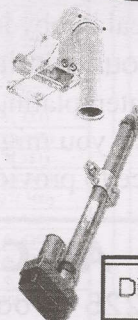
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Actuator Arms

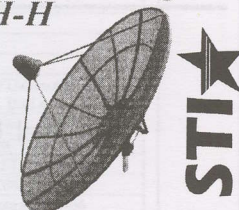
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B3/152	7 Cent. Feed	12.310H	1TV	3/4	5(,100)
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	UBI	12.425V	up to 13 TV + radio	3/4	22(,500)
	Globecast 2	12.525V	13 TV, 8 radio	2/3	30(,000)
	Globecast (feeds)	12.550-555V	1TV	3/4 & 2/3	6(,110/670)
	Globecast	12.564V/T13	2+ TV	2/3	30(,000)
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	UBI	12.640H/T14U	11+TV	3/4	22(,500)
	Globecast 1	12.658V/T7	14TV, 15 radio	2/3	30(,000)
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D1/160E	Sky NZ test	12.394V	TV +	3/4	22(,500)
	SBS SE	12.451H	TV+	5/6	12(,600)
	Sky NZ	12.519V	TV+	3/4	22(,500)
	Sky NZ test	12.519H	TV+	3/4	22(,500)
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	ABC Northern	12.550H	TV	7/8	14(,294)
	ABC Western	12.577H	TV	7/8	14(,294)
	ABC Victoria	12.595H	TV	7/8	14(,294)
	ABC Qld	12.613H	TV	7/8	14(,294)
	Southern Cross	12.744V	TV + 1 radio	3/4	5(,100)
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	ABS-CBN	12.575H	4+TV, 4+ radio	2/3	13(,845)
	MYSAT	12.646H	up to 8 TV	3/4	28(,066)
	JEDI/TVB	12.686H	11+ TV	3/4	28(,126)
	PnGlobal Aust	12.726H	6+TV	3/4	28(,066)
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(,500)
	Hallmark Asia	4166/984H	1 TV	3/4	6(,620)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(,125)
	Hwazen TV	4130/1020H	1 TV		
	NHK Joho	4060/1090H	7TV, 1 radio	1/2	16(,180)
	FOX Mux	4040/1110V	up to 5TV	7/8	26(,470)
	NET +	4121/1029V	1 TV	3/4	4(,774)
	ESPN USA	4020/1130H	8+TV, data	3/4	26(,470)
	Discovery	3980/1170H	8 typ.	3/4	27(,690)
	CalBqt/Pas8	3940/1210H	up to 3+ FTA	7/8	27(,690)
	CNBC HK	3900/1250H	up to 7TV	3/4	27(,500)
	FilipinoMUX	3880/1270V	up to 8TV+radio	5/6	28(,694)
	CCTV Mux	3829/1321H	up to 4 + 1 radio	3/4	13(,240)
	TVBS-N	3836/1314V	1FTA, 4+ CA	3/4	17(,500)
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(,632)
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(,000)
	Discovery Asia	3764/1386V	Up to 6 TV	3/4	19(,850)
	MTV	3740/1410H	8	2/3	27(,500)
I2/169E	WA Mux Pv	12.281V	3+ TV, radio	2/3	27(,500)
	Ariang TV	12.401V	1TV	3/4	4(,400)
	ABS-CBN	12.575H	4TV, 2 radio		13(,845)
	Test mux	12.715H	6+ TV	2/3	30(,000)
	TARBS feeds	4090V/1060V	9TV + radio	3/4	21(,000)
	BBC SCPC	3986/1164H	1TV	1/2	5(,700)
	Middle East	3836/1314V	4 typ	3/4	13(,331)

Receivers and Errata

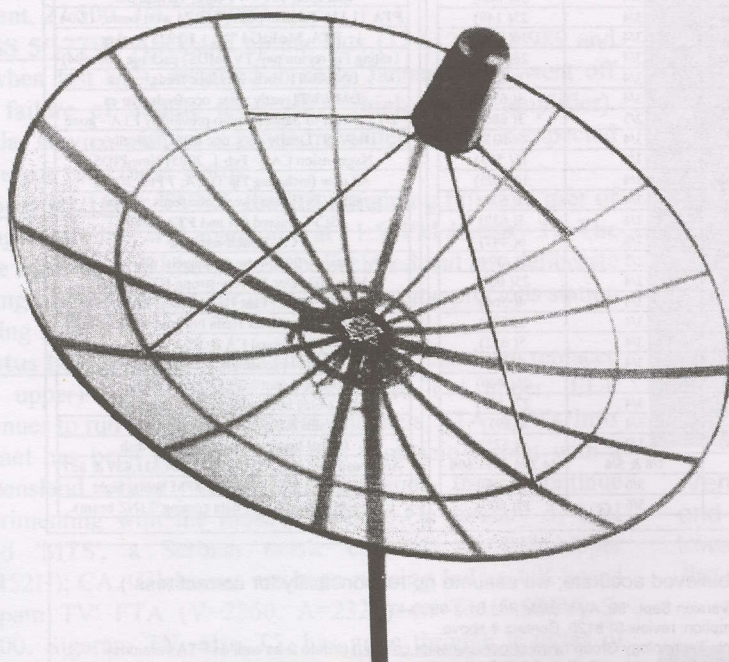
was on 4048V; New Caledonia, parts of Australia
 FTA SCPC; or, 3774H, 6.520, 3/4 (June 06)
 Irdeto 2; 4060V HDTV CA; also try 4020V
 PowerVu; some FTA (Ch. 1 & 3)
 CA & FTA NTSC: Japan, Taiwan
 (ApStar 6: also 4180V same #s; some analogue also)
 also try 3660/3540Vt, Sr 30,000, 3/4; some FTA
 North beam; also try 3875R, 12.475, 1/2
 Strong NZ & Australia; may now be 1/2, 6.525
 Aust East beam - 3 FTA + 14 CA
 Was B1: moved June 2006, concerns B1 failures
 differs from 12.407 C1; tune ch FTA; NZ+Au
 Now Irdeto V2
 NZ + Au, FTA + Mcript CA
 occ feeds, NZ + Au; recently 12.553V
 AMTV, Healing only FTA svcs now here
 High performance beam; not NZ; new CA 07-06
 High performance beam; not NZ; new CA 07-06
 NZ + Au (Mcript, PowVu capable)
 High performance beam; not NZ; new CA 07-06
 High performance beam; not NZ; new CA 07-06
 ABC WA tests, FTA
 SBS, radio tests WA FTA
 Irdeto V2 CA, tests (GWN, WIN)
 not currently in use
 Tests, SBS-NDS CA, others FTA when here
 NZ (90cm) + Australia (Only C1 svc left on NZ)
 Australia NA only (leakage to Norfolk, New Cal)
 Australia NA only (leakage); 9-Net x 3 widescreen
 Arrow radio (still here), tone FTA
 Pay-per-view movies; CA
 Pay-per-view movies; CA
 Pay-per-view movies; CA
 ABC for Foxtel/Austar; previously 12.288V
 changes September 2005
 Austar inter; Expo FTA
 NDS CA + Mcript; CA
 CA, subscriptions available Australia, Norfolk
 Sky News active; 'Help x 2' FTA
 CA, subscriptions avail Au, Nrlk; TVSN FTA
 CA, subscriptions available Australia, Norfolk
 "Home"CA, subscription available Australia, Nrlk
 CA, subscriptions available Australia, Norfolk
 CA, subscription available Australia, Norfolk
 CA, subscription available Australia, Norfolk
 B1 figure 8 elliptical; stops January 31, 2007
 +12.420V, Au + NZ beam
 +12.469H/Qld, 12.487H/South,
 +12.546V, 12.581V, 12.608V, 12.644V: NZ only
 +12.546H: NZ only
 Australia only
 Australia only
 Australia only
 Australia only
 Australia only
 Australia only
 Australia only
 +12.671V, 12.707V, 12.734V: NZ only
 & 12.286, 12.326; FTA prev. 526 V10112, A1012
 FTA-Australia
 CA -Australia
 FTA V=5340, A=790 -Australia
 June 2002-Irdeto-2 CA -Australia
 Some FTA-Australia
 Dateline west; also east PAS2, 3901V
 Temporary FTA (January 2007)
 PowVu CA
 PowVu CA & FTA; sub available-changes 05-06
 was PAS-2, previously 3992Vt; feeds FTA
 NET25 + FTA; new PIDS April '03; reload
 PowVu CA; ch 11 DCP-CCP bootload; audio FTA
 PowVu/CA (some audio FTA)
 PowVu CA & FTA (EWTN + CBS + TBN +)
 NDS CA (6 channels); one test card occ FTA
 Myx FTA V1960, A1920 + radio FTA
 PowVu FTA, replaces PAS-2 svc
 CCTV cross pole; new SR 04-06
 PowVu CA
 PowerVu; some audio FTA
 PowerVu; Asian MUX; new parameters Nov '03
 # 8 MTV China FTA V289, A290; rest CA
 PowVu CA, WIN, ABC NT, SBS; status unknown
 Test - may not stay permanently
 Temp FTA; subs Aust 011-800-2270-0722
 initially with 6 NTSC colour bars
 Occ FTA (Chile +); BIG power reduction Nov 03
 BBC World moved here January 2005
 Subscriptions available; Strong Technology



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Email: info@psau.com

<http://www.psau.com>

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(PAS2/169E)	Adventists.tv	4040/1010H	1	2/3	5(900)
	Feeds	3868/1182H	1	2/3	6(620)
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(620)/7(498)
	Cal PowVu	3901/1249H	up to 8	3/4	30(800)
	HK bouquet	3850/1300H	up to 8	2/3	24(900)
	Korean Bqt	3771/1379H	1	3/4	6(510)
AMC23/172E	Various-tests	12 730H	up to 8	3/4	30(000)
I804/174E	iPSTAR	12 619H	1	2/3	25(220)
	Tests-NZ beam	12 646H	1	3/4	22(418)
	RFO Poly	4027/1123R	1TV	3/4	4(566)
1701/180E	TNTV	11 060&11 514V	9	3/4	30(000)
	TVRFO	11 136V, 11 174V	6+TV, 3+ radio	3/4	23(149)
	Canal+Sat	11 610H	16TV, 1 radio	3/4	30(000)
	PBS	12 648HH	16TV possible	3/4	28(066)
	TVNZ/BBC	4186/964RHC	1	3/4	5(632)
	TVNZ	4178/972RHC	1	3/4	5(632)
	AFRTS DTS	4175/975L	3 TV, 3 radio	2/3	3(680)
	TVNZ/Aptn	4170/980RHC	1	3/4	5(632)
	Fiji Sky Pacific	4095/1055LHC	6TV + future radio	3/4	16(505)
	Fiji Sky Pacific	4055/1095LHC	7TV + future radio	3/4	16(505)
	TVNZ/feeds	4052/1098RHC	1	3/4	5(632)
	TVNZ feeds	4044/1106R	1	3/4	5(632)
	NBC to 7 Oz	3960/1190R	1	7/8	6(447)
	TBN Mux	3927/1223R	4TV	2/3	11(394)
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(000)
	Ioarana	3772/1378L	1	3/4	4(566)
	NASA TV	3854/1296R	1 TV	3/4	2(000)
	TVNZ	3846/1304R	1	3/4	5(632)
	NBA (Barker) Ch	3803/1347R	1	3/4	6(111)
	USA feeds	3749/1401R	4?	?	26(400)
NSS-5/177W	Pacific IP Data	3763/1387R	none-data	3/4	27(500)
	RFO/Tempo	3920/1230R	1	3/4	2(893)
	BYU-TV	4185/965R	1TV, 20+ audio	1/2	6(525)
	Australia Temp.	12 522V	8 SCPC	7/8 & 5/6	14 294 & 12 600
	Auckland Teleport	12 612V	New Mux 01/07	5/6	28(989)
	iPSTAR Tests	12 691V	8 TV	5/6	17(600)

Receivers and Errata

New December 2003; 24/7 "Hope Chs."
FTA (occ sport); also try 3863, Sr6.100
FTA-typ NTSC-occ sport, live Shuttle
PowVu CA + FTA (includes BBC-W 05-05)
was 4148Vt; some FTA
Korean MUX, reload 12-04; new Sr
Testing on NZ/East Australia beam
Tests, late May start; also 12.646H
Testing possible data links; June 2003
SE spot beam; was 4027LHC
east spot; 10TV + r each, vertical pol.
FTA 11.136 Tahitian beam, 11.174 west beam, 12/04
1+ FTA, MediaGd "2"; + 10.975 weaker
Testing Fiji region pay-TV (MDS) package (Oct '04)
DMV/NTL early vers. occ feeds, typ ca
DMV/NTL early vers., occ feeds, typ ca
DTS Direct to Sailors; audio previously FTA - gone
DMV/NTL early vers. occ feeds, typically ca
Nagravision CA (> Feb 1, 2005) New PIDS
All now (including Fiji 1) CA; 7 Feb, 2005)
DMV/NTL early vers., occ feeds, typ ca
SCPC, mixed CA and FTA feeds
CA, Leitch encoded
January 2006-now 4 channels, new Sr
New PIDS Dec 03 very strong NZ, Pacific
FTA SCPC; East Hemi Beam-Tahti
24/7 live NASA - West Hemi bm (can be difficult!)
SCPC, mixed CA & FTA, feeds
NBA feeds - probably CA - new Nov 2003
16-QAM (not MPEG-2 compatible)
Data only but useful for dish alignment
Wallis & Futuna Island(s) service
Global beam - requires sizeable dish
Aust beam: 12.522, 538.555, 574.604, 621.639 & 657
NEW Sept 2006; Tuesday 8PM hobby night
CA Tests - Taiwan TV; data coming?? (NZ beam)

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. AV-COMM P/L, 61-2-9939-4377.
AV-COMM Tiny Tot. FTA, 12Vdc operated, palm sized, low power consumption; review SF#120. Contact # above.
Coship 3188C. Review SF#107. Blind search FTA rcvr; works well. Phoenix Technology Group (www.phoenixsatellite.com.au) (Irdeto 2 as well as FTA versions)
Coship FTA, CA, HDD. Review SF#143, state of art functions, blind search. Phoenix (above). Satlink NZ, fax 64-9-814-9447.
Divitone: "Left-handed" review SF#115; does "code key" entry. Available <http://www.satmax.ws>
eM-Tech eM-100B (FTA). eM-200B (FTA + Ctx2), eM210B (FTA + 2xC1 + positioner); KanSat 61-7-5484 6246 (review SF#89)
eM-150/Homecast. FTA + embedded multi-format, review SF#144. Sciteq (61-8-9409-6677) and Kristal (61-7-4728 7704)
Fortec Star Lifetime. Two versions, both blind search, code-key programmable, one X 2 C1. Review SF#119. www.aDigitalLife.com
Homecast (em-150, eM-1150, eM-2150) series of FTA, CA, HDD state of art STBs, review SF#144. Sciteq (www.sciteq.com.au)
Humax ICR1 5400 (Z). Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available; new software avail 04-04, SF#76.
Humax IRC1 5410 (Z). Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available; original importer Sciteq (www.sciteq.com.au).
Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good.
Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.
Hyundai HSS800C1. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.
INNOVIA IDS3088. Review SF#111. Blind search FTA receiver. High quality IRD; available Phoenix Technology Group, and Satmax (<http://www.satmax.ws>).
ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI Interface slot Irdeto 1 & 2; review SF#109. Sciteq 61-8-9409-6677.
KSF-570 FTA digital receiver, import; KSC-570 adds CI x 2 (no test or user results available). Asoft Limited, 64-4-234-1096
KSC-N550H2 'Premium Dual DVR' digital receiver (no test or user results available). Asoft Limited, 64-4-234-1096
MediaStar D7.5. New (May 00) single chip FTA; review June 2000 SF. MediaStar Comm. Int. 61-2-9618-5777 (www.mediastar.com.au)
MediaStar D10. FTA and Irdeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.
MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. SF#95, p. 14.
Nokia 9200/9500. When equipped with proper software, does Aurora, originally did pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)
Pace DGT400/DVR500. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818). UECs replaced.
Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version (see SF#115, p. 15).
Phoenix 111, 222, 333 models (no longer produced): Service, backup - Phoenix Technology Group 61-3-9553-3399; www.phoenixsatellite.com.au
Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, CMT etc). For service only - call Scientific Atlanta 61-2-9452-3388. For revision model D9850, see Scientific Atlanta (below).
PowTek. Blind Search Chinese sourced, field tests rate it highly. Source jason@adigitalife.com
Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-2749); no longer available.)
SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above); no longer available.
SATWORK ST3618. Blind search FTA receiver. Fast search, problems, especially in "memory-filing" system; review SF#111. Available DMSi at tim@dmsiusa.com.
SATWORK ST3688. Blind search, 3000+ ch memory, multi-format RF modulator; improved version 3618. Review SF#113; available DMSi (above).
Scientific Atlanta D9223, D9234, D9225. Orig. PowerVu, superceded Dec 2003 by D9850. Commercial receiver, available TVO 61-2-9281-4481, John Martin
Strong Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).
Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.
Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, does code-key with additional software, Aurora. Strong Technologies 61-3-8795-7990.
Strong 4800 II. SCPC, MCPC CAM slots x 2 for Aurora +, Zee, Canal +, code key with additional software. Strong Technologies (above); review SF#103.
Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84), does code key with additional software; Strong Technologies, # above.
UEC Atlas/Titan (1000). New July 2003, replacing DGT400 for Austar. No SCART, L-band loop; also available Rural Electronics 61-2-6361 3636.
UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faulty P/S. Norsat 61-8-9451-8300.
UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel, limited FTA (Nationwide - 61-7-3252-2947); P/S problems.
UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers; propensity to fall off back of trucks.
"X" Digital. When modified with "aftermarket" Internet software, does Aurora and other V-1 CA without card; review SF#119. Strong Technologies (61-3-8795-7990).
Accessories:
Aurora smart cards. MCrypt (Irdeto V2) cards now available (Jan 2005). Sciteq 61-8-9409-6677.
PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)
PowerVu (Pacific) repair service. Cable & Sat Svcs, Darius West, 61-2-9792-1421 (Email darius@cases.net.au)

WITH THE OBSERVERS

AT PRESS DEADLINE

AsiaSat 4/122E: "MUTV is new to 4120Hz, FTA at the moment, 27.500, 3/4." (Peter)

NSS 5/177W: Auckland uplink mux (12.612H, 28.989 and 5/6 when last 'up'), restarted in early January, then went off with failure of middle level HPA (high power amplifier). Regular service with an expanded channel line-up is expected before you read these words.

Optus B1/160E: TVNZ, the last remaining full-time user of this aged satellite, will abandon it at 11:59PM January 31. The future location of B1 has not been disclosed and any deliberate shifting of the satellite's location will consume precious station keeping fuel.

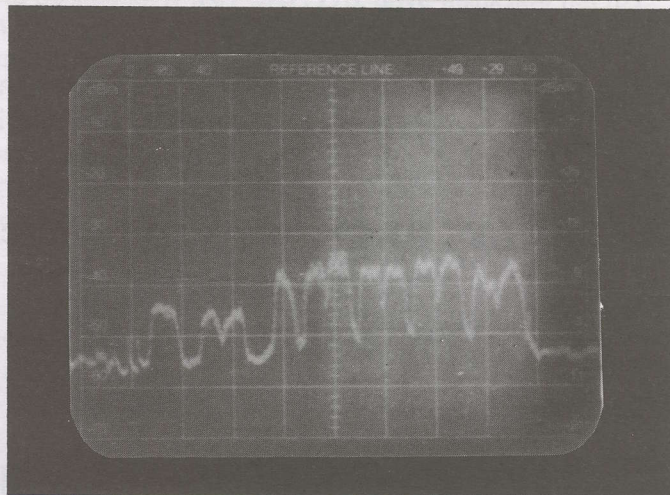
Optus B3/152E: "On UBI, Turkish 'SINT' has been replaced (T11 upper) with Turkish 'TMAX'. Also T11 upper, 'EL+' continues to run (other) UBI Greek channels, FTA. UBI's 'Info' channel has been be structured into a mosaic format with a (Queensland time zone) clock and they continue experimenting with the mosaic content. On January 5, UBI added 'MTS', a Serbian music channel, to T11 upper (12.452H); CA. Globecast has been running Indian-UK based 'Deepam TV' FTA (V=2360, A=2320) on T5/12.525V, Sr 30.000. Sigaram TV, also T5, has gone through a series of source changes, currently 'TTN' and FTA. Also FTA for a few weeks, 'Duna TV' (Hungary) on T5 (V=2665, A=2625), but back to CA January 8." (IF, Qld.)

Optus C1/156E: "Fox News, using USA spelling of words, is now available with teletext. The 'Adults-Only' service on 'Main' is gone, but two 24/7 adult 'on-demand' film channels remain functional with high priced porn." (AI, NSW)

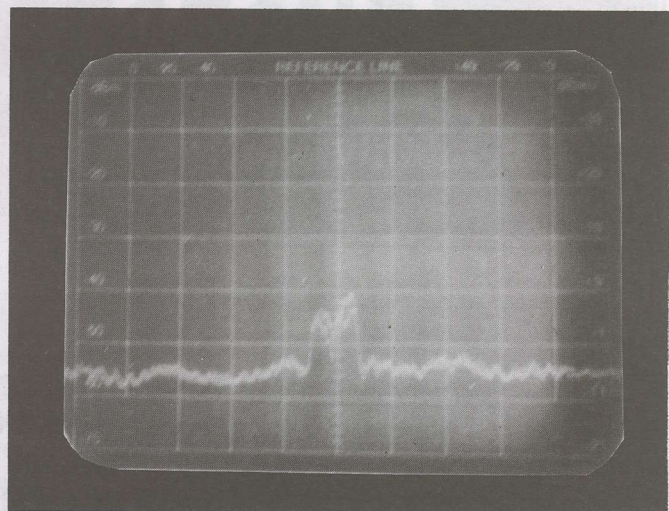
Optus D1/160E: TVNZ will begin transmissions on 12.483Hz sometime after 12 midnight February 1 (see p. 30 detail). There is no confirmation when (or if) SKY NZ will also be shifting to the NZ footprint Hz transponders here (see SF#148, p. 7). SKY NZ has begun Box Office Movies on (new) 12.394V (Australia + NZ beam). Southern Cross Central is now on 12.744Vt, moved from AMC 23.

PanAmSat PAS2/169E: On February 1 this satellite will have a name-change to "Intelsat 2" - no other immediate changes.

PanAmSat PAS8/166E: On February 1 this satellite will have a name change to "Intelsat 8"- no other immediate changes. FTV Entertainment, FTV News (3991V) have left for JcSAT2. "The two TAS muxes, 3860H and 4080V, have disappeared from this satellite." (MK) (Editor's note: This a major loss for radio format listeners with dozens of unique



Vertical at 1:03PM Wednesday January 10 (above) and horizontal at 1:04PM (below). B1 signals appear towards left in vertical display (weaker than D1), only the two test SKY half transponders on D1 horizontal appeared. On February 1 - this is changing.



radio channels playing continuous music 24/7.) "Hwazen Satellite TV has moved to 4130V from 3860H. Hallmark (Asia) TV has been FTA 4166H, Sr 6.620, 3/4." (Nan) (Editor's note: A major rupture of undersea fibre optic cables following an earthquake in the Taiwan region of the South China Sea created the need to replace the fibre feed with satellite on an emergency [albeit short term] basis.)

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. **Photos of yourself, your equipment** or off-air photos taken from your TV screen **are welcomed**. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady.

Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for February 15th issue: February 4th by mail or 5PM NZST February 5th if by fax to 64-9-406-1083 or

Email skyking@clear.net.nz.

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-Advertising reservation cut-off dates-

February 2007 # 150: Friday February 2 with copy in our hands Tuesday February 6

March 2007 #151: Friday March 2 with copy in our hands Tuesday March 6

April 2007 #152: Friday March 30 with copy in our hands Monday April 2

May 2007 #153: **NOTE - special issue with SAME closing deadlines as April 2007 issue!**

June 2007 #154: Friday June 1 with copy in our hands Wednesday June 6

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Safeway Electronics Ltd, **Suva + Lautoka + all islands** (Ph 3395300/6666822; safeway@connect.com.fj)
SATSHEK Communications, **Suva** (Ph3307933; parmarbros@connect.com.fj)

French Polynesia

Telexpert-Tahiti, **all of French Polynesia** (Ph 689 77 11 25; Fax 689 83 89 00; telexpert@mail.pf)

New Zealand:

Tauranga TV Svcs Ltd, western **Bay of Plenty** (ethnic Ku packages) (Ph 07 578 7276; dave-tts@clear.net.nz)
Raycom, **Coromandel Peninsula/Waihi/Tairua** (B1 FTA) (Ph 07 864 8083; raycom@slingshot.co.nz)
Frontline Electronics, **Mosgiel** region (ethnic Ku packages) (Ph 03 489 4001)
Advanced Aerials, **Napier/Hawkes Bay**, comcls (Ph06835 6618/021 272 6618; advancedaerials@xtra.co.nz)
Nelson TV & Video Svcs, all **Nelson Bays** (Ph 03 548 0304; ntv@tasman.net)
Rexels AV Electronics Ltd, **Palmerston N, Manawatu, Hawke's Bay, Wanganui** (Ph 06 357 6186; rsi.blair@xtra.co.nz)
John Stewart, **southland** including Otago (john.s@tritec.co.nz)
The Antenna Man, **Taranaki** (Ph 06 758 1633; antenna.man@xtra.co.nz)
Quality Pics, entire **Waikaito** region (Ph 0800 007 667; maxnkay@xtra.co.nz)
Smartzone, **Wellington-Wairarapa-Palmerston N** (C+Ku) (Ph 029 289 6333; info@smartzonesystems.co.nz)
Homestead HiTech, **Wellington, Masterton-Levin** (PAS-2, B1, B3) fitzgera@ihug.co.nz)

Australia Wide

Regional Outcomes (60+ locations, **all states, territories**) (03 9923 7333; installs@regionaloutcomes.co.au)

New South Wales:

Woolgoola Antenna Service, **Coffs Harbour** (50km radius) (Ph 0266561889; woopaerials@iprimus.com.au)
Town & Country Antennas, 60km radius **Murwillumbra/Tweeds Heads** (Ph 02 6672 8595)
Newcastle Satellite, **Newcastle + Lwr Hunter Vly** (Ph 0249614449; satellites@netcentral.com.au)
Home Satellite TV, 40km radius **Port Macquarie** (Ph 02 6584 3838; kazbah25@optusnet.com.au)
Goodcom Communications P/L, 100km radius of **Walcha** (Ph 02 6777 1044; goodcom@northnet.com.au)

Northern Territory

ALLSAT TV, **Darwin and NT**; (Ph 08-8927 1300, 04 3771 0797; allsat.tv@pacific.net.au)

Queensland:

Teleworks, 100km of **Cairns** (C + Ku). (Ph 0412 84115; rajvrm@aol.com)
Cape York Electronics, **Cooktown and 'the cape'** (started 1970s) (Ph 07 40 695 252; cyectn@tpg.com.au)
Phil's Antenna Systems, 100km radius of **Hervey Bay** (C+Ku since 1996). (Ph 0741 256 273)
Rick Dalton TV & Satellite, 100km of **Kawana Waters** (C + Ku). (Ph 07 5493 4343; rick@antechtv.com.au)
Videotronics Mackay, **Mackay/Whitsundays** radius 200km. (Ph 07 495 575 052; sales@videotronics.com.au)
Tableland Ant Svcs, **Malanda, Atherton T'lands + 'Gulf/ Cape'** (Ph 07 40966262; tabantennaserv@bigpond.com)

South Australia

Central Eyre Comms, **Arno Bay-Eyre Penins.** (Ph 08 8628 0203; centraleyrecomms@ozemail.com.au)

Tasmania:

.65 Electronics, **Launceston and Northern Tasmania** (Ph 03 63 330820; sales@65group.com)

Victoria:

Riviera Satellite Antenna Svcs, 100km radius **Bairnsdale** (Ph 03 5152 4884; gilhoolestv@net-tech.com.au)
Leden Communications, (100km radius) **Glengarry** (Ph 0427 745105; leden@netspace.net.au)
Geoff's Communications, 60km radius **Korumburra** (Ph 0408 582010; gwyyhoon@tpg.com.au)
Foreign Satellite TVP/L, **Melbourne (region)** C+Ku since 1995 (Ph 040445509; joe12@dodo.com.au)
H and J Instruments, (100km radius) **Wodonga**, C and Ku since 1970 (Ph 02 6027 1574)

Solomon Islands

Satellite Solutions, **Honiara + all Solomon Islands** (since 1994) (Ph 677 25589; satsol@solomon.com.sb)

Thailand:

JSAT tv/Jon Clarke, **ex-pat community - nationwide** (Ph +661 513 5418; info@jsat.tv)

To be listed here, tell us: 1/name of your business or your name, 2/ your home town and radius-distance covered from same, 3/ your telco, 4/ your e-mail. Send to skyking@clear.net.nz, or fax to ++64 9 406 1083 or mail to SatFACTS, PO Box 330, Mangonui, Far North, NZ. No, there is no charge to be listed **but** you must be a SatFACTS subscriber! (* - NEW or modified this listing.)

Soapbox: In answer to query, "Has anyone in NZ found SelecTV here?" this information (name and exact location deleted): "(name) in (South Island location) has his spun metal 3m and he gets all PAS-8 Ku transponders, of which 12.756 is the weakest at around 50%. He is using the Fuji Ku prime

focus LNBf which is really hot for DXing." (a reader) "This could affect TVUplayer and others cached in China: Beijing announced 29 December it is now illegal to broadcast TV programmes using Internet. Specifically mentioned were (www) cnettv.com and cntv.net.cn." (Harold)

Synopsis: TVNZ transfer February 1st from B1 vertical to D1 Horizontal

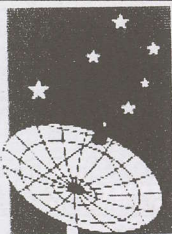
"TVNZ will be transferring its free-to-air digital test services from Optus B1 satellite to the new D1 satellite; essential because B1 has reached the end of its useful life and is unreliable. Work will begin at midnight 31 January when signals will cease from B1, resuming a few hours later on D1, same 12.483GHz, but with a new polarity; horizontal. TVOne, TV2, Deutsche Welle, CCTV9, Bloomberg and TVNZ Wide Screen test channels will all transfer. A second (half transponder) horizontal signal on 12.456 GHz will test for one week; *only*. All set-top boxes will need to be retuned manually; viewers will use their remote control to locate the on-screen menu, select the tuner and "H" or "Horizontal" polarity and then choose the desired channels. From Monday January 15, an on screen crawler caption on each (12.483V B1) test channel will operate, in rotation 24 x 7 until 11:59PM January 31. Viewers who have difficulty retuning should contact the company that supplied or installed the equipment. Ric Carlyon, Digital TV Group, TVNZ Auckland (email digital@TVNZ.co.nz, fax [09] 916 7897 or telephone [09] 916 7658).

Coop's note: When B1 is turned off at 11:59PM January 31, that is it. There will NOT be any signal there past that point - they will not be simultaneously feeded B1V and D1 H - just to clear that one up!

Translation: to Kiwi "Technician Talk"

OK - so B1 is "unreliable." Actually, it remains quite reliable (no recent failures); unfortunately it is a 'moving target' and challenges TVNZ's uplink to find it "reliably" and is now moving north and south of the equator sufficiently that many 65/76/90cm dishes are losing it for several hours each day. A quick lesson: Virtually any LNB you will encounter has inside of it two metal probes, at 90 degree rotation to one another (photo, page 9, SF#148). One of these is initially adjusted with the receiver's LNB powering voltage set at 13/14 volts for maximum reception on vertical (such as SKY or B1's TVNZ) and minimum reception when the menu on the receiver is accessed and told to send 18 volts to the LNB. Because at 18 volts, the second in-LNB antenna probe is activated - and being 90 physical degrees in alignment to the 13 volt probe, it ignores the vertical signals and responds only to horizontal signals. And if there is still vertical signal coming in at 18volts? The LNB is improperly installed, and requires rotation (twisting on its own axis as in a circle) until the vertical reception quits at the 18 volt receiver setting. This is not rocket science (see twin photos, page 27 here)!

One supplier is suggesting users "twist their LNB 90 degrees" to repickup the TVNZ mux. You could do that but why? Simply access the receiver menu and under LNB (powering) voltage select 18 volts rather than 13/14. The LNB will switch for you without crawling to the dish, loosening screws, and making a mistake calculating "90 degrees."



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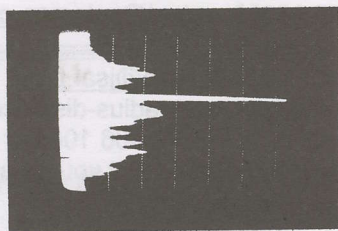
Ph - 02 9939 4377 Fax - 02 9939 4376

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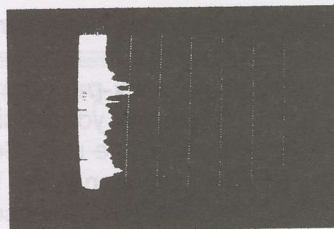
Email - cdarry@avcomm.com.au

Since late 2004 broadband interference in the C-band satellite spectrum has been ever present in the Sydney metropolitan area wiping out an estimated 10,000 C-band viewers as well as many commercial sites. This interference caused by Unwired Australia has now spread to Melbourne. To fight this interference, Av-Comm has designed a range of products to allow customers to continue using C-band systems.

- IF Filter 950-1450Mhz
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Spectrum Showing Unwired



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PHONE: (9411) 2694 255, 2699 757, FAX: (9411) 2698 730

Bob Cooper
P O Box 330
Mangonui
Far North
New Zealand.

19 July 2006

Dear Bob,

Many thanks for the copy of *Television's Pirates* which has just arrived -- I can barely lift it!

I'm very glad you wrote your memoirs, because this is a fascinating collection of anecdotes and a vital part of the TV broadcasting and satellite communication history. It's a part that official writers and pure academic researchers may well underplay in their own accounts.

**"...a fascinating collection of anecdotes and a vital part
of the TV broadcasting and satellite communication history."**

In October 1945, (Sir) Arthur C Clarke conceptualised geostationary satellites - the precise placement of earth-orbiting 'in place' satellites equipped with solar-refreshing powering systems and microwave relay equipment capable of receiving earth-originated transmissions and rebroadcasting these signals to earth. Clarke's hypothesis appeared in British publication "Wireless World" and attracted but limited response. World War Two was barely completed, microwave technology was little understood while rocketry - the essential ingredient required to launch into orbit "radio relay stations," an even less mature technology. But this was the origin of satellite TV and from this technology paper would come the direct-to-home television we all enjoy today. **"Television's Pirates: Hiding behind your picture tube"** traces this development focusing on the individual creators who made it all work - the people who turned Clarke's theory into reality.

Sir Arthur C. Clarke and more than 700 other individuals are featured in "Television's Pirates." This is the true story of how the entire world reacted when Clark's hypothesis became fact. A typical reader response:

"I received 'Television's Pirates' today and as today is my day off, I managed to read the first chapters. It is really great - I have never read anything so detailed on the television (reception) business. Additionally, my CATJ + CSD set of DVDs have also arrived; I have not been this fascinated in ages! I am torn between the CATJ and CSD features and completing Television's Pirates!"

(James Stanley Barr, Frankston, Texas)

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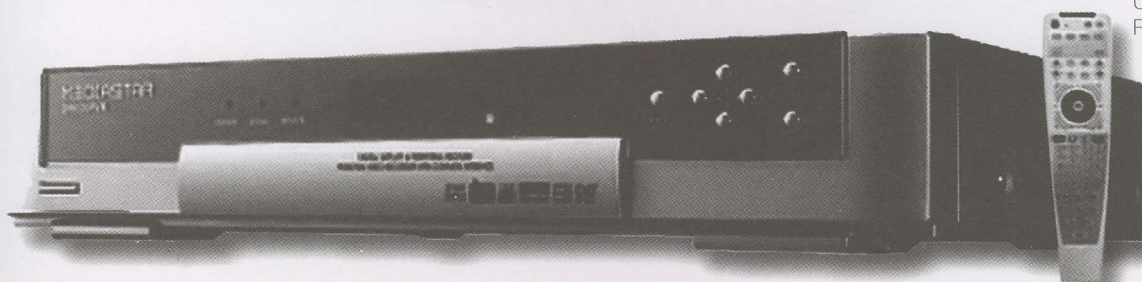
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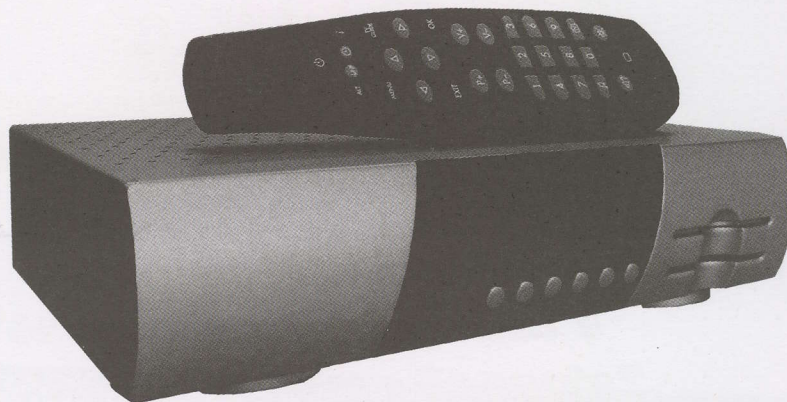
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